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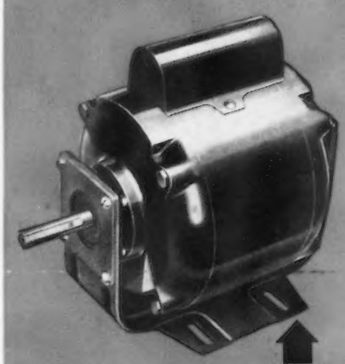

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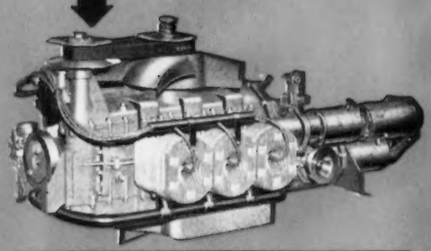

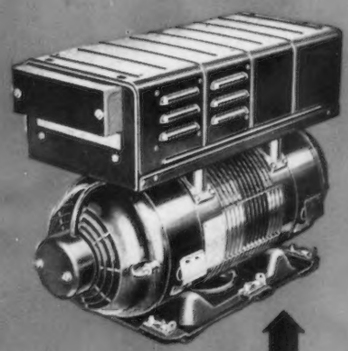

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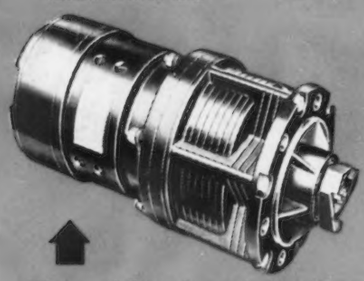

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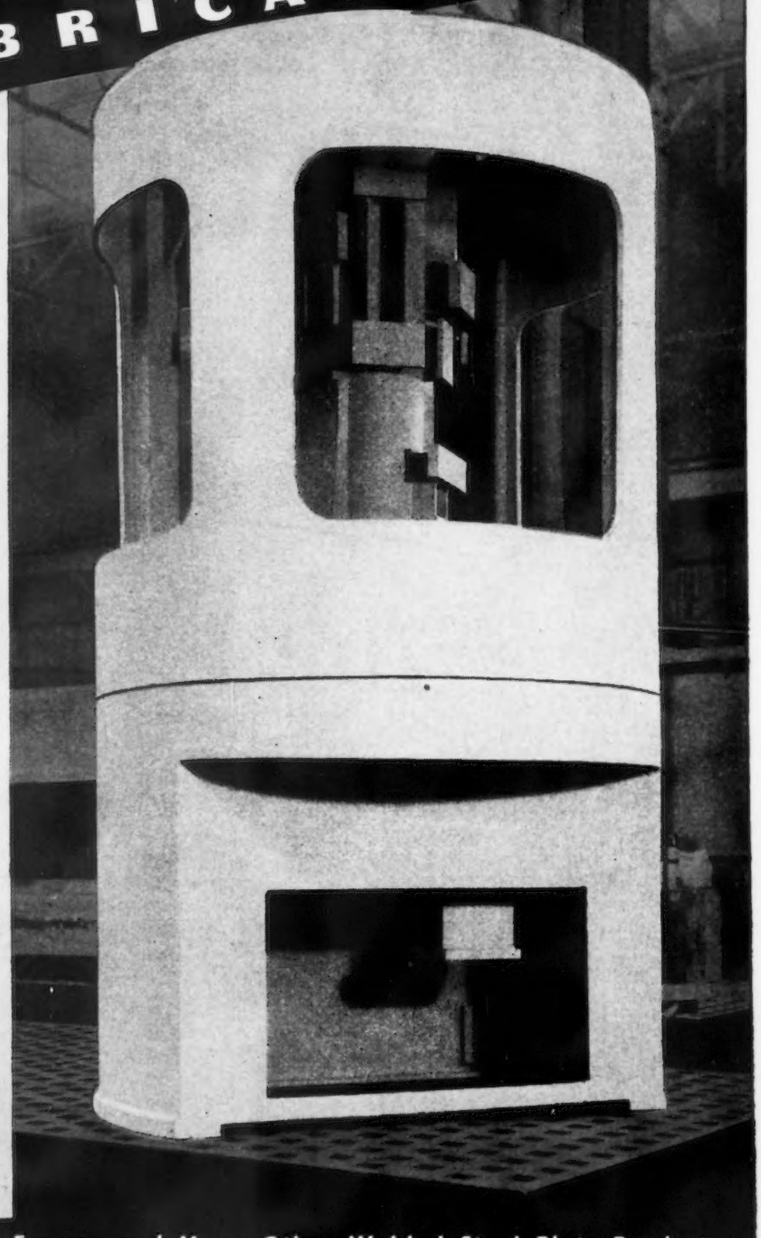

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Concentration or Diversion?

WHEN one thinks of success in business, he usually personifies it by thinking of individuals. And in thinking of individuals, the question arises: Why did this man succeed?

Certainly it is not heredity that determines it, although a good mother has always been a principal asset. Washington and Lincoln had that in common although they came from opposite sides of the railroad track.

And it is not education. Even in our technical fields, some of our greatest accomplishers did not possess engineering degrees. Schooling helps but the lack of it does not always hinder.

My own opinion is that the greatest asset is what one might call a "single track mind." One having this concentrates on an objective and sticks to a straight-line path until he reaches it. Once in a while he may have to detour because of road obstructions but he always manages to come back, as soon as possible, to the predetermined route.

Because of our system of free enterprise, which has made this country what it is, these routes to success have been individual ones. There has been no main highway, well marked with traffic signs, but each individual has chosen and surveyed his own road.

This diversion of paths which has characterized the courses of successful business men and manufacturers, while it has led to the maximum public benefit through the fullest capitalization of our economic assets, has in fact made those who followed it vulnerable in the present inspired conflict between the employer and the employed. Smart, but not altogether unselfish, labor leaders and politicians who seek the votes of their followers have realized the advantage of marching together down one road towards one objective while their chosen opponents are going a thousand ways at once.

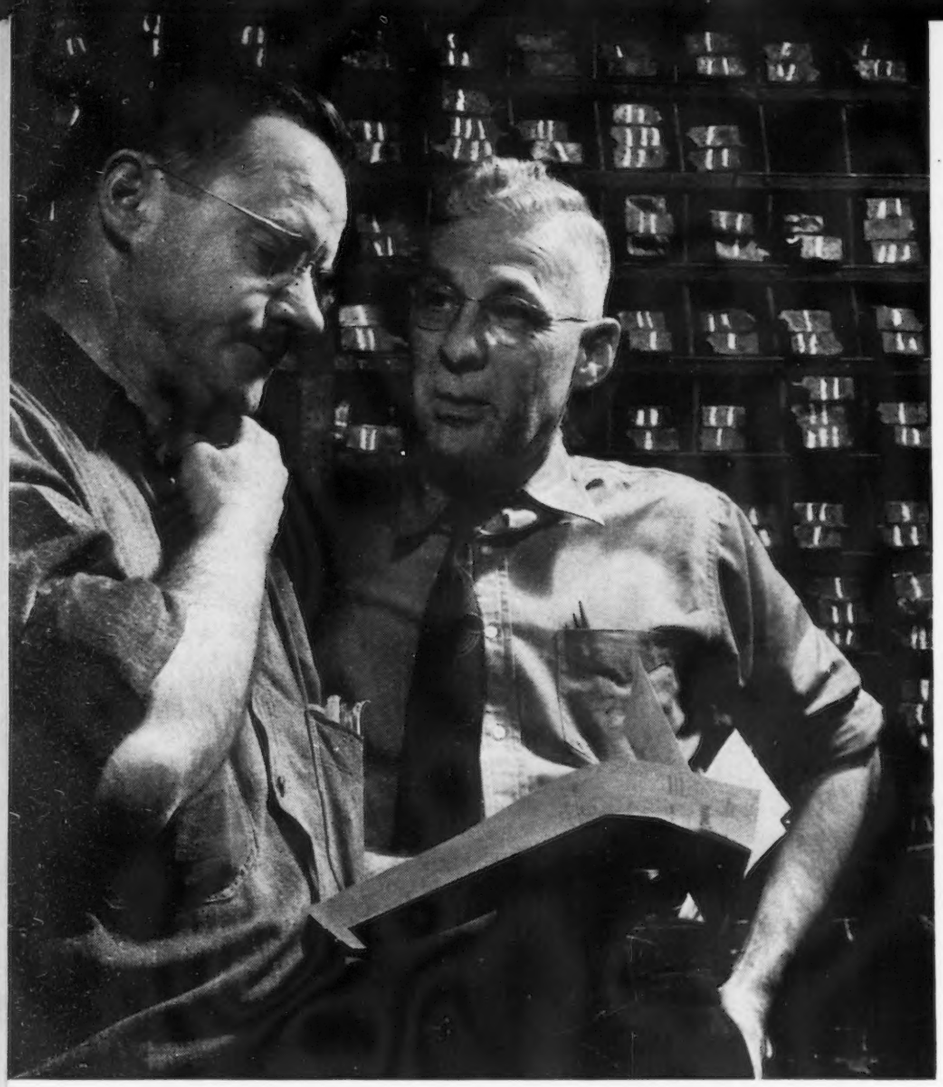
Thus, we find in the so-called "labor movement", not merely a collection of single track minds heading in a thousand different individual ways, but a unified movement in a single given direction.

American management, especially industrial management, has been credited with capitalizing the assets of effective organization. Quite truly it has so done as exemplified by our highly integrated industries. What remarkable results these individualistic organizations have accomplished in moving to their objectives is a world's wonder.

But the old cliche about the better mousetrap is out of date. Capitalism under our American system has the most salable product in the world and the poorest salesmen when it comes to merchandising it to the public. We are going in too many directions at once.

Labor, on the other hand, in spite of minor internal discords has traditionally followed a single path. That path has led beyond the lanes of individual plants and factories; beyond the roads of specialized industries and geographical areas and has emerged into a broad road down which a multitude under unified leadership marches toward political power.

Until and unless capital and management in America develop a similar leadership which results in concentration of effort instead of diversion, they will continue to be progressively relegated to the background of public opinion. Such leadership today is unfortunately lacking. When and if we find it there will be a new day for America. A day in which capital and labor may leave the road leading to political preference and march side by side down the avenue of the economic allies towards more for all.



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INLAND STEEL

► Metallic tin output from Malaya from all sources in 1946 is estimated at 12,300 tons, and 46,000 tons are predicted for 1947. Further estimates predict 72,000 tons for 1948 and 73,000 in 1949. In 1940, Malaya ore output was over 80,000 tons.

Purchases of stocks of tin concentrates made in Malaya by the British Tin Ore Buying Agency totaled 3200 tons at the end of January 1946. Purchasing by the agency is on a basic tin price of $1200 per ton f.o.b. Malayan ports.

► Passenger car output in Britain has increased from 2399 units in November to 10,701 in February. The latest production is split almost evenly between the home and export markets.

British Austin representatives estimate a market in America for 250,000 small English cars every year, in the 8-10 hp class.

► Razor blade manufacturers are shifting to cemented-carbide dies for longer life in the handling of more highly alloyed steels.

Increases in Cr and Mo promise a better razor blade than any previously available, and importations of such steel from Sweden are discouraged as they fall into a higher duty bracket.

Another of the expanding fields of application for carbide punches and dies is blanking and laminating. To date excellent performance has been obtained on blanking of steels and other metals in thicknesses up to 0.025 in. in rounds and simple shapes. Development work is steadily progressing on more complicated shapes and greater thicknesses.

► A World's Fair is to be held in London in 1951 with the government promising to spare no expense to make it the greatest ever. It will be held somewhere in the central part of the city on a site not yet determined.

► Germany changed to high frequency spot-welding machines not only to obtain smaller and lighter welding transformers but also to improve the welding process itself.

The Germans developed a double spot-welding machine that operated on a welding current of 1000 cycles. This double spot-welding method besides saving time and energy has an advantage in that the secondary circuit is very short. Double spot-welding also enables the welding through of insulated layers between metal sheets.

► Experiences of at least 20 foundries with Thermotomic, an exothermic material, indicate particularly favorable results with regard to reduced feeder head size, lower cleaning and finishing costs as well as sharply lessened scrap losses.

The material can be molded into core rings for use as feeding rings or can be mixed with facing material. Equally applicable to ferrous and nonferrous metals, Thermotomic imparts no impurities to the metal nor does it contain carbon, sulfur or phosphorus.

► Development of Fe-Ni-Ti alloys adds to the list of alloys having controllable coefficients of expansion. These alloys can be fabricated readily, and with cold working of the order of 35 to 50 pct followed by age hardening more desirable expansion and thermoelastic characteristics with increased strength and hardness than was formerly obtainable can be produced.

► A technique of infiltrating a molten copper alloy into a porous iron or steel compact made by standard powder metallurgy methods has been made commercially practicable.

Complicated shapes, processing high strength and density can now be produced at comparatively low cost and utilize relatively low pressures.

► The British Labor Government has at last announced its intention to nationalize the steel industry. While details have not as yet been given, a large measure of public ownership for the industry is forecast.

► Price ceilings on the bulk of machine tools and equipment are expected to be removed by May 8.

Arcwelding Equipment In Wartime Germany

By CAPT. F. W. MYERS, JR.
Chief of Welding,
Research and Development Div.,
U. S. Army Transportation Corps.

o o o

Numerous types of automatic and semiautomatic welding equipment were originated in Germany in an effort to speed production, but few were developed to the point of practical application and none found really wide acceptance. In this concluding article of a series of three, the author describes the salient points and operating procedure of these somewhat unorthodox machines.

THE principal methods used for the study of welding stresses were not radically changed in Germany during the war. Probably research by X rays was the most widely known and applied method. As is well known in this country, only stresses on the surface can be determined by this method, but from this a reasonable deduction can be made of the internal stresses in the section. In the majority of cases mechanical means were used by the Germans for measuring the length changes in weld specimens being tested.

The first article of this series, "Arcwelding Trends in Wartime Germany," appeared in the Feb. 7, 1946 issue; the second article, "Wartime German Ship Welding," in the Mar. 21, 1946 issue.

It was found that tests on small specimens did not give a complete picture of the dimensions and the distribution of stresses in welded structures of working size. To remedy this situation, the Deutscher Ausschub fur Stahlbau (German committee on steel construction) initiated research on welded beams. The results showed that welding stresses which originated in the restrained structure changed with the amount of restraint. Also, when the parts to be welded were heavier and larger, and the heating during the welding operation was more unequal, the welding stresses increased dangerously, especially so when the steel was quench hardened.

No new methods for minimizing or removing welding stresses were found during wartime. Since welding stresses could not be avoided with the usual steels, stress relief annealing or normalizing after welding was the most radical method used in Germany. This was naturally limited to small and medium sized fabrication, although in a few workshops furnaces were built for annealing large welded beams and drums. In the welding operation itself it was found that stresses could be kept low by appropriate design of the welded joint, and suitable fixture of the parts to be welded. In addition, type and diameter of electrodes, amperage, welding rate and welding sequences also were a deciding factor. Good results were obtained by preheating with oxyacetylene welding.

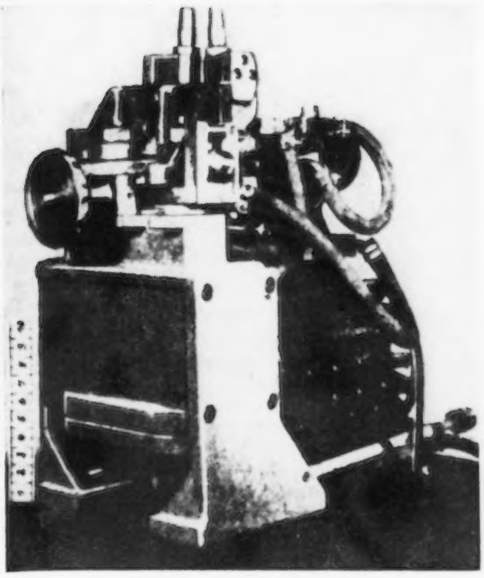
For steels used in bridges and other engineering construction the bead weld nick-bend test was most commonly used. The main objection to this test is that a great deal of material is necessary for it, and the results are only subjective since the fracture must be included in the judgment.

In summary of the above it can be seen that the control of stresses in welded construction advanced at a far more rapid rate in the United States than in Germany during the war.

Spot Welding at Medium Frequencies

From examination of documents and equipment concerning the spot welding of light metals in Germany, it is evident that the frequency of the welding current was, until a few years ago, accorded little significance. This may be the result of the fact that welding machines used in the light metal processing industry were operated only with 50 cycle current so that the problem of whether low or high frequencies were more advantageous was seldom discussed in considering the manufacture of equipment of this type. Low frequency machines in Germany had the disadvantage that the power plants and their transformers had to be very large. For economic reasons, the output of such machines had an approximate capacity of at least 300 kva. Furthermore, these machines were usually stationary on account of their size.

The change from normal frequency to high frequency welding machines in Germany was undertaken not



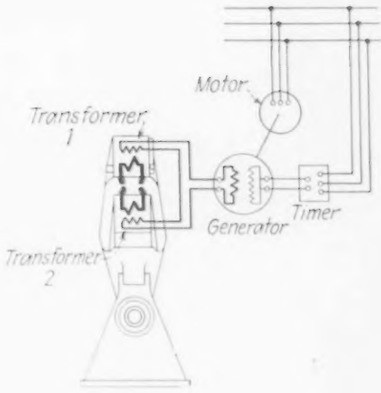
LEFT

FIG. 1—Welding head of the Berghaus double spot welding machine which is capable of producing 120 welding spots per min.

o o o

RIGHT

FIG. 2—Wiring diagram of the Berghaus double spot welder, showing the manner of energizing the electrodes.



only to obtain smaller and lighter welding transformers, but also with the idea of improving the welding process itself. The above mentioned principles, it was learned, led to the development of a double spot-welding machine operating on a welding current of 1000 cycles. This machine was designed by the laboratory Bernhard Berghaus and has been manufactured by the Berlin-Lubecker Maschinenfabrik for about one year.

The new welding machine developed by the Germans has several interesting characteristics. The double spot-welding method, besides saving time and energy, also has an advantage in that the secondary circuit is very short. The electrodes are directly on the welding transformer, see fig. 1. Therefore, the secondary circuit is constant in its length, which prevents a discharge of the welding machine arms. The double spot-welding method also enables the welding through of insulated layers between the sheets, for example, lacquer layers, etc.

The energy accumulator consists of a fly-wheel which furnishes a great amount of energy during the welding procedure. Its charging is effected during the welding break. Under those conditions, about 60 welding units per min can be made, which equals 120 welding spots per min. The driving engine is in most cases an ac short-circuit motor of 22 kw capacity and only 29 kva connecting value. Instead of ac motors dc motors can also be used.

As fig. 2 shows, the switching of the welding current is accomplished in the exciting circle of the generator. The advantage of this is that only 10 pct of the welding energy has to be switched and regulated.

The current generator works without a switch directly on both transformers. A small mercury-arc rectifier of 10 amp capacity serves as a switch. The switch is encased in a movable case from which welding current and welding time can be controlled. The electrode pressure and the welding current are automatically controlled by means of a foot-contact. All light metals up to 3/16 in. total thickness, sometimes even more, depending on the alloy, can be spot-welded.

Semiautomatic Carbon Arc Welding

Although carbon arc welding was known for a long time in Germany not too much attention was given to this procedure until the war years. Then thin sheet metal was one of its main applications. The Germans found that welding with the carbon arc could be performed according to two different procedures. In one case the arc brings the butting edges of the parts to be connected into a plastic state and then fuses them together. This method, which is termed pure carbon

FIG. 3—Method of bronze facing a steel bearing shell by the carbon arc method. Note the economy of material effected.

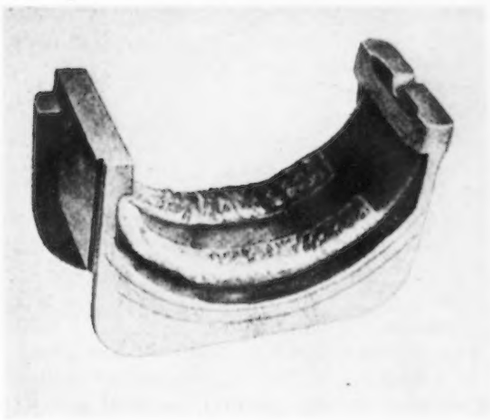
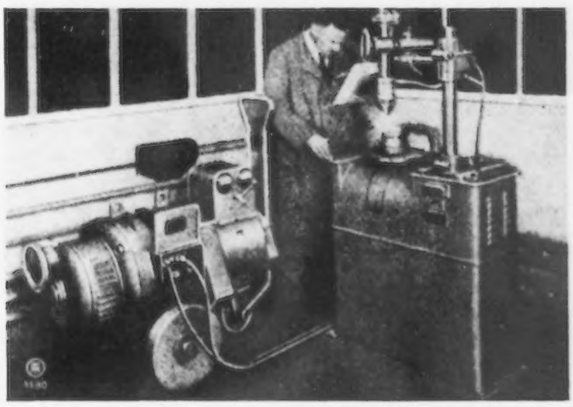
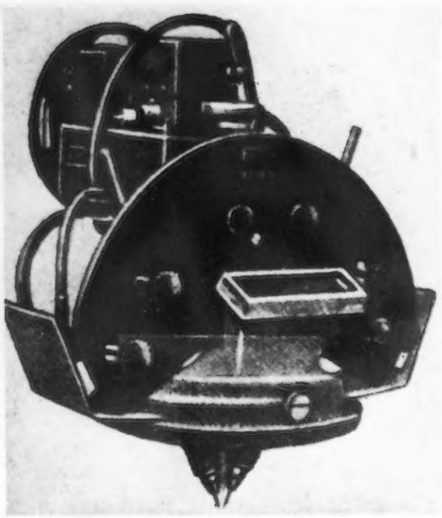


FIG. 4—A German circular seam carbon arc welding machine in operation.



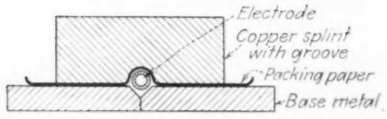


LEFT

FIG. 5 — Welding head of an automatic atomic hydrogen welding machine.

RIGHT

FIG. 6 — Sketch showing the arrangement of the various elements used in the Elin-Hafergut process when making a butt weld.



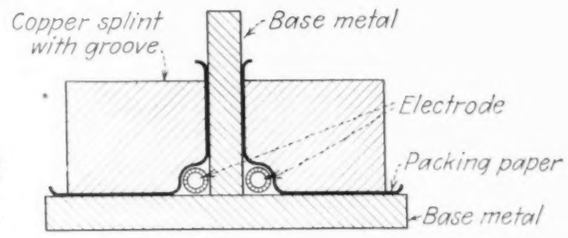


FIG. 7—When making a double fillet weld with the Elin-Hafergut process, both sides may be welded simultaneously.

welding, makes it possible to perform over-lapping or butt-welds on sheet steel 1/32 in. to about 1/16 in. thick. In the second procedure the carbon rod is only used to obtain the arc, a special welding rod furnishing the filler-metal. Parts exceeding ¼ in. thick were generally welded in this way.

Carbon arc welding proved particularly economical in certain special applications; for instance, it was claimed broken motor casings of cast iron could rapidly be repaired by carbon arc welding and without preheating. In the case of malleable iron, worn-out surfaces were easily hard-faced, and hard-facing of a steel surface with bronze was likewise claimed as a simple operation. Carbon arc welding, according to German sources, offers particular promise in future welding development. See figs. 3 and 4.

Atomic-Hydrogen Welding

Atomic-hydrogen welding has also been steadily gaining ground in Germany. In the early stages of development it was exclusively manual, but during the last few years various devices have rendered possible its fully automatic or semiautomatic application (see fig. 5). In this case, too, automatic welding gave a smoother and more uniform seam and secured real economic advantages, although, in many respects, this procedure differs greatly from all the other welding methods. Its main field of application was repairing broken tools and manufacturing new ones. Tubes, vessels and sheet metal were also welded in quite a satisfactory manner by the automatic atomic-hydrogen procedure, in which case no filler-metal was used. With pieces which did not exceed 3/16 in. and where the edges to be jointed were clean cut and even, the successful production of good welds was not difficult. The only thing that was considered a drawback was that welding without filler-metal usually resulted in a weakening of the seam. If such a weakness was deemed inadmissible in a structure, the filler-metal was added by hand and bare wires, or even strips of the base-metal, were used. Experiments, the object of which was to try and add filler-metal when performing the operation mechanicaly, were in progress in Germany during the war. As to fillet welds made by this process, they do not appear quite satisfactory as compared to American standards. The restrictions prohibiting the free disposal of tungsten, limited greatly the field of application of this automatic procedure.

Elin-Hafergut Procedure

As soon as the Elin-Hafergut semiautomatic procedure was made public in 1939 in Germany, it became the object of numerous and close investigations as to its practical value.

Simplicity, current and time saving properties are the main advantages claimed by this system. The experiences which were gathered in this respect since 1939 may be summarized as follows: (1) It is necessary to insulate carefully the work pieces to be welded; (2) proper and stable current power, as well as short and sufficiently thick welding cables are necessary for success; (3) In the case of heavy seams, prewelding by hand is recommended for best results; and (4) not all electrodes are suitable for this procedure; those with manganese constituents are necessary for best results.

The main advantages claimed for the Elin-Hafergut process are that it gives semiautomatic results without the expensive automatic welding machines which, at the time of this invention, cost in Germany approximately 8000 to 10,000 RM, or $3000 to $4000. In addition, claims are made that the process increases the efficiency and productivity of manual welding by 30 to 40 pct.

The procedure is to lay the electrode on the seam of a butt or fillet weld, and then place a copper splint, provided with a groove, over the electrode as shown in fig. 6 and 7. Any kind of paper, such as wrapping paper, is interposed between the electrode and the copper splint to insure better results by absorbing the oxygen which normally would be found in the joint. The electrode, covered with the paper and the copper splint, is connected at its free end to the electrode holder, or to any corresponding smaller current clamp. The arc is started by scratching across the bare end of the electrode and base-metal with a metal wire or carbon rod.

Claims of 28 pct ductility, and more, are made for welds produced by this method, and it can readily be seen that a very fine and uniform appearing weld deposit is obtainable. In setting up the splints, care must be taken by the operator to avoid any warping

or cracking of the electrode coating, and the electrode must always be kept in a uniform position to obtain a uniform deposit.

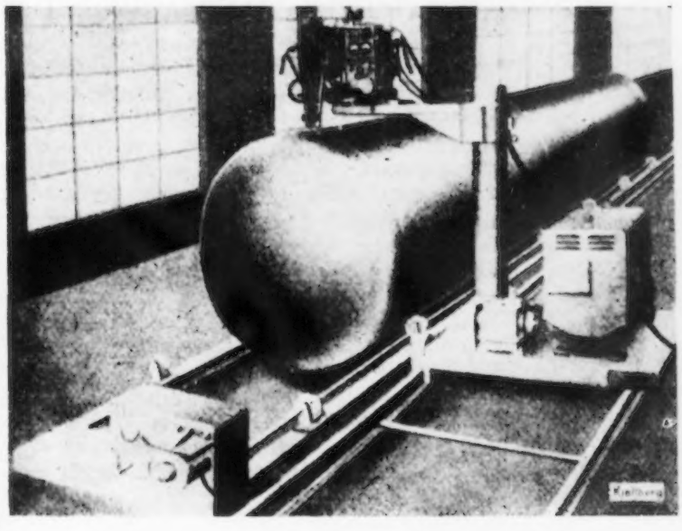
As may be seen in the illustrations, a small void must be left between the electrode and the covering splint so that there will be room for the slag to rise freely to the surface of the weld. Electrodes from 3/32 in. to 3/8 in. diam and up to 56 in. long have been used successfully. In addition to the qualitative superiority, it is also claimed that any unskilled worker can do all the operations required with a minimum period of instruction.

An example of the possible advantageous use of this process is on the side walls and roofs of railroad cars. It is possible for an operator to work four welds simultaneously from four different machines. After the first setup, and while the electrodes are melting, the operator can be preparing four new joints. To prevent weld metal dilution it is necessary to keep the copper splints cool by dipping them in water. Copper was determined to be the best material for the splints after a number of other materials such as iron, cement, and sand were tried with only fair results.

The Kama Procedure

The Kama procedure was little publicized in Germany in general. Its main advantage was that it afforded the possibility of doubling the time of effective current connection. In some cases of welding by hand, experience showed the advisability of having two welders working with only one transformer. The double hand-welding cable is, in this case, handled by two operators; a moment before one electrode is completely melted off, the other welder takes over the work and goes on welding with his electrode. The first welder has sufficient time to clamp a new electrode in the holder and to hold it in readiness. This method makes it possible, consequently, to spare a welding machine. The Kama system is based on the same principle, with the difference that a single operator has one electrode welded after the other. By setting up the holder, the welder starts the electrode, which then melts automatically, whereby its inclination gives it a backward gliding motion. A short time before the first electrode has been melted, a second electrode is placed in another holder above the first one, which is soon taken away; the new one begins to melt in its turn, and thus the welding process goes on without interruption. This procedure is confined to fillet-welds below 45°. Butt welds likewise can be performed in this way but only to a limited extent. The author was informed that it was not intended to give the Kama system general application in the German welding industry.

FIG. 8—The Kjellberg automatic welder set up for welding longitudinal and circular seams on a pressure vessel. Operating on dc, this machine makes use of two electrodes embedded in a common coating.



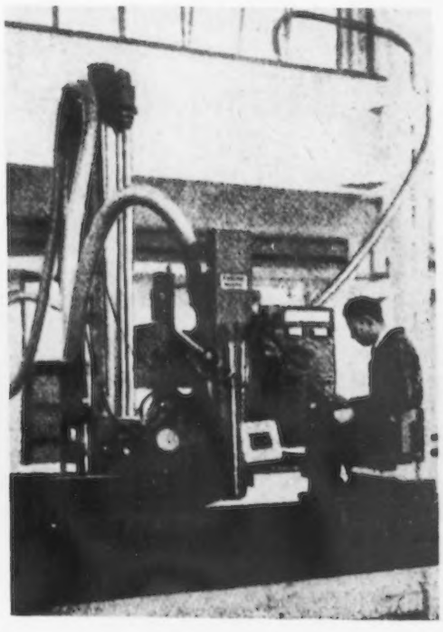
Automatic Welding Machines

The development of automatic welding machines in Germany was particularly rapid late in the war. In many factories they were considered standard equipment and proved in most cases really efficient and advantageous. At the beginning of their development they were designed to be fed by bare electrodes, but gradually welding with coated electrodes was developed. One of the best known methods in Germany is the Kjellberg automatic welding machine, shown in fig. 8. There are many different types of these machines in Germany. Some of them are combined for ordinary hand welding electrodes and require the replacement by hand of the burnt-off electrodes. In others, the feeding of the welding wire is automatic, while in a third category special coated electrodes were invented and, like bare wire, could be wound on reels without cracks appearing in the coating.

From the economic point of view, the advantages of automatic machines found a limit, in that the diameter of the electrodes which could be used with automatic machines in Germany was much greater than that of the electrodes for hand use, so that their only superiority was a more profitable consumption of current.

The general welding output thus being increased only in a small degree by the welding machines available to the German market, the Kjellberg firm modified the

FIG. 9—In the Kaell method two electrodes are used with ac, and arcs are produced between both electrodes, and between each electrode and the work.



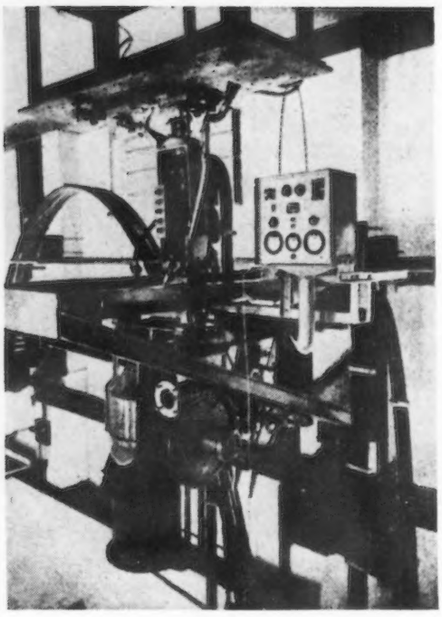


FIG. 10—Ellira fully automatic welder using powdered flux, and patterned very closely after the Unionmelt process.

holder and designed their normal direct current welding machines so that double electrodes could be used. The two electrodes were imbedded in a common coating.

The Kaell Procedure

While in the Kaell method two electrodes could be melted at a time and the volume of the molten mass, consequently, increased, a more recent development of the same firm under the name of "Kaell procedure" permits double electrodes being welded in an ac arc. Two of the current feeds are connected each with the tip of one of the rods; the third feed is connected to the workpiece. This combination produces a triple arc, one from each wire core towards the workpiece and one from one electrode to the other. Besides the general advantage of double electrodes, this arrangement has an additional advantage of proportioning the heat between the double electrode and the workpiece. The amount of heat which is transferred to the base-metal is, in this case, greater than when operating with the ordinary arc and can be controlled and adapted to the circumstances. This advantage affords the possibility of increasing the output by feeding both electrodes with higher current.

German welding specialists in this field predicted greater adaptation and success would be attained in the future with this procedure, a unit of which is shown in fig. 9.

Ellira Welding Method

Numerous German publications have dealt with the Ellira welding method which belongs to the fully automatic type and is patterned very closely after the American Unionmelt process. It appears, however, to be very much more massive and unwieldy than its American counterpart, as may be seen in fig. 10. Joints with a cross section up to 2 in. may be welded in one pass and at relatively high speed. Operators were able to obtain a much more substantial increase in production than with any other automatic or semiautomatic procedures found in Germany. Test results showed that satisfactory welds were obtained, but in spite of this the method found relatively little application.

The German welding industry did its best to promote this process for shipbuilding as well as for general industry, especially after receiving reports of the excellent production results obtained by the similar process in American shipbuilding. But although the country was committed to an all-out production drive, acceptance of the method was by no means general. A study of the various automatic processes described above indicates clearly that while German engineers were not lacking in ingenuity, they did lag considerably in the final development and application of automatic welding equipment.

The opinions and findings expressed in this article are the private findings and opinions of the author, and are not to be construed as the official opinions of the U. S. Army.—Ed.

Laminated Plastic for Machine Table Ways

CUTTING, scoring and undue wearing of machine tool ways are claimed to be minimized by the development of nonmetallic table ways by G. A. Gray Co., Cincinnati.

Made of laminated plastic, these ways are attached to the table by laminated plastic pins. The laminations of both the plates and the pins are at right angles to the bearing surface, a design consideration which both theoretical considerations and practical experience have shown to be of great importance. Laminated plastics have been used for many years by the Navy for stern bearings and also for roll neck bearings in steel mills, as well as for automobile timing gears, but this is believed to be the first time the material has been used for facing table ways.

In addition to the nonscoring and wear resisting qualities so essential for all guiding surfaces, laminated plastic has another advantage on high speed reciprocating members where the bearing surfaces may be subjected to heavy pressures, namely, its heat insulating quality. This is of particular value on planer tables, for without some form of heat insulation, even a slight temperature rise generated at the V bearing surfaces is transmitted to the lower plate of the box section table, causing it to expand and curl up at the ends. This curling not only destroys the accuracy of the planer work, but also permits dirt to get under the table V's, and further increases the danger of cutting and scoring. As planer table speeds have very greatly increased during the last few years, many now running at 300 fpm, the danger of scoring and curling has greatly increased. Due to the heat insulating qualities of the laminated plastic plates, practically no heat is transmitted to the metal table. In consequence, it is possible to run the table of Gray planers with nonmetallic ways at any feasible speed without danger of the table curling up at the ends.

Carbide Die Applications, Present and Future

By EARLE GLEN
Manager of Die Sales, Carboloy Co., Inc., Detroit

FIG. 1—This large Carboloy die has an ID of 13½ in. The nib alone weighs more than 100 lb. It is in constant daily use for deep drawing steel cylinders.

Deep drawing carbide dies as large as 13½ in. ID, are among the newer uses of carbide dies described in this article. Many other applications of this material, concealed in the past by wartime secrecy and which are only now coming to light are reviewed in detail in this appraisal of present and future carbide die applications.

WHEN hard cemented carbides made their initial appearance in German industry during World War I, they were first used as substitutes for nonobtainable diamonds for the drawing of fine tungsten wire. Use of carbides for cutting tools at that time lagged behind the metal's application to dies for wire drawing. Introduction of the idea of carbide tipping, however, gave a tremendous impetus to the use of this metal for tools, until today it is estimated that more than 50 pct of all the metal machined with single point tools in the United States is cut with carbide tools. Thus, in a comparatively few years, carbide metal has increased its usefulness and scope of applications so much that instead of being a substitute for costly diamonds it is now actually superseding low-cost steel in countless instances.

In fact, the increase of carbide as a tool metal during the past few years has been so spectacular that it has tended to eclipse the more gradual but equally important development of carbide as a die metal. For some years past, carbide dies have been standard equipment in the drawing of round wire in the entire wire drawing industry. Steel wire of 0.40 to 0.50 pct carbon content and as small as 0.005-in. diam is regularly drawn through carbide. So is copper and bronze wire as small as 0.062 in. diam and pure tungsten wire as fine as 0.006 in. The principal reason is that carbide dies outlast comparable steel dies by at least 20 to 1, besides giving greater uniformity of product, closer tolerances and a better finish to the work. Carbide dies have also increased the average speed of wire drawing. In some cases, rather phenomenal speeds are being employed experimentally for wire drawing at the present time.

In other fields of drawing with carbides, however, including the drawing of tube, bar stock, and shapes, and the deep drawing of sheet metal, advances were not nearly as rapid in the period immediately preceding World War II. Until about 1940, for instance, the largest carbide die for deep drawing sheet metal was only about 4-in. ID. The largest carbide dies and mandrels for tube drawing at the same period measured about 3 and 1½ in. in diam, respectively. Such items as carbide blanking and laminating dies and dies for bolt heading and cold nosing were practically unknown to the metal working industry at that time.

Use of carbide dies in general was greatly accelerated by the war program. In fact, the use of carbide dies was a major factor in obtaining and maintaining high production rates on numerous war items. Cartridge cases, of both brass and steel, are excellent examples. For the brass cartridge cases, experience showed that one Carboloy die did the work of 20 tool steel dies. Under war production demands, the sizes of deep drawing carbide dies rapidly increased to diameters of 6 in. and even 7 in.

Today, there are carbide dies for deep drawing with ID's as large as 13½ in. in regular service, see fig. 1. Inasmuch as the carbide nib for a 13½ in. die weighs in excess of 100 lb, as compared with 18 lb for a 3 in. carbide die nib, special techniques for the production of such large dies had to be specially adapted. One such is the hot press method wherein the three operations of pressing, semisintering, and sintering are combined into a single operation, see fig. 2. Advances of this nature have materially aided

the carbide die industry in producing large diameter die nibs which hold to just as close tolerances and produce the same high surface finish as the smaller sheet metal dies.

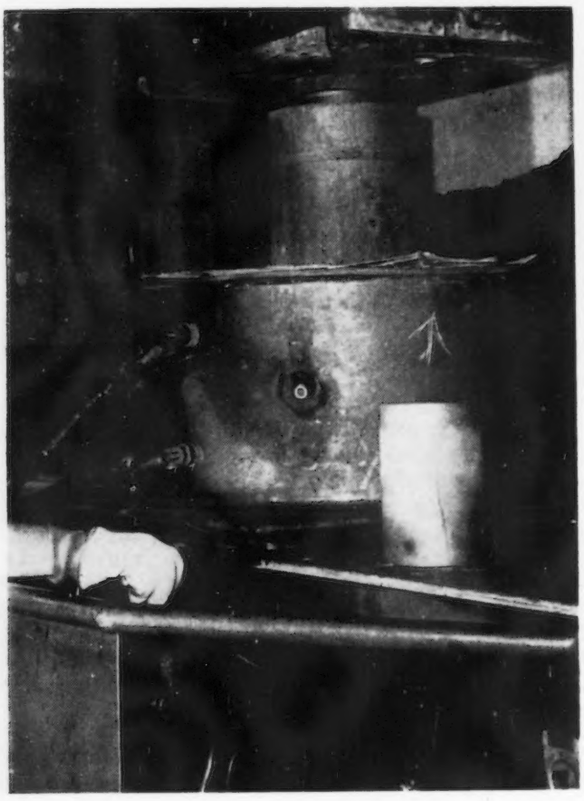
As for the products being drawn through carbide dies, there is a far wider variety of shapes being currently produced than there was in the prewar days. There is also a much greater variety of metals being drawn on carbide in production. For example, there is considerable activity at this time in applying carbide dies to the manufacture of kitchenware and household utensils in general, especially items like coffee pots, small and large funnels, and pressure cookers. Carboloy dies are also being used increasingly for the production of containers for dry cells. As to the metals now being economically drawn on carbides, reports from the field show that this includes plain carbon steels; special alloy steels; stainless steels; brasses; bronzes; copper, aluminum alloys; zinc alloys; lead, and tin.

Reports from users indicate that the appreciably longer life of carbide dies is not their only advantage. In addition, they cut down the amount of servicing required, noticeably step up production, and give a better surface finish to the metal, thereby often reducing subsequent buffing time. Moreover, carbide dies reduce the total number of dies required for a given operation, thereby also greatly decreasing the total die inventory of a plant, and result in less down time of equipment for die maintenance and servicing, thus increasing press availability.

A typical example is the experience of an Eastern manufacturer who estimates that of his company's 4,000,000 deep drawing operations every year (in the production of high pressure cylinders for fire extinguishers and storing commercial gases), fully 95 pct are performed with Carboloy dies. These dies range in size from an ID of 2 in. to an ID of 13½ in. The completed gas containers range from 2-in. diam by 6½-in. long to 8¼-in. diam by 32-in. long. The metal stock used runs from 0.040 to 0.440-in. thick, before drawing, and includes tough chrome moly steel, SAE X-4130, in addition to other types of alloy steels, plain carbon steels, stainless steels, and various aluminum alloys.

Widespread use of carbide dies in this plant has resulted in reducing scrap by some 50 pct, has increased the number of O.K.'d pieces turned out by at least 30 pct and has noticeably improved the completed product by eliminating surface defects from the finished pressings. Die life throughout the entire plant has been increased by a ratio of 20 to 1 over what it was when steel dies were used. Moreover, whereas the steel dies needed repolishing after every 2500 draws, carbide dies are not serviced until after some 10,000 comparable operations, see fig. 3.

FIG. 2—Special hot presses have made possible the production of large dies by combining pressing, semisintering, and sintering into a single operation.



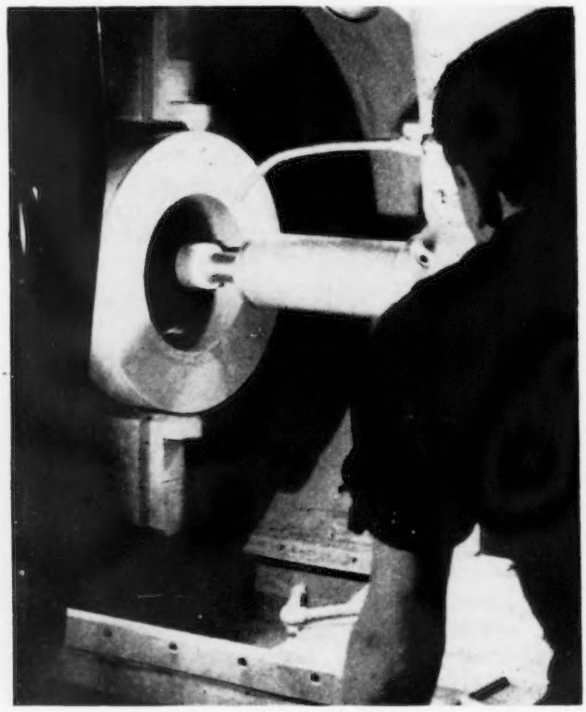


FIG. 3—Reconditioning a 13½-in. cupping die. The steel ring is first ground, and then the Carboloy die nib is polished with a 3-in. diamond wheel.

It was found that no changes had to be made either in press operations or lubrication practice when changing over from steel to Carboloy dies. Nor were changes made in the basic die design, although some changes were made in die size. As a direct result of the latter, however, the total number of drawing operations required was reduced by some 15 pct. For example, a cylinder previously requiring six draws now requires but five draws on Carboloy. This is due to the fact that the carbide dies permit heavier drafts to be taken without reducing service life of the dies materially.

The field of application for carbide punches and dies for blanking and laminating is steadily increasing. To date excellent performance has been obtained on blanking of steels and other metals in thicknesses up to 0.025 in. in rounds and simple shapes. Development work is steadily progressing on more complicated shapes, and thicknesses greater than 0.025 in. On present jobs averages of 1,500,000 to 2,000,000 punches are being obtained with Carboloy dies and punches between regrinds, as contrasted with a comparable average of some 50,000 operations for steel punches and dies.

A typical instance of lamination die practice is to be found in one West Coast factory where laminations are punched out of sheet metal on single step

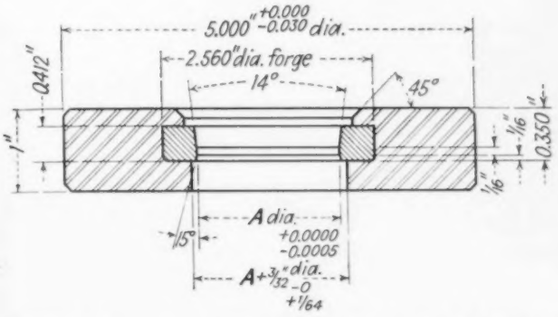


FIG. 4—Special carbide die for drawing thin wall steel tubing. Notice the extremely short bearing surface necessary for this operation.

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index machines in the manufacture of stators for electric motors. This particular application is unusually severe in that the sheet steel, although only 0.016 to 0.018-in. thick, contains 2.50 pct silicon and 0.12 pct carbon, and in addition, is given an annealing treatment which forms a tight scale on the steel. This scale is said to have valuable electrical insulating properties, but it is also extremely abrasive.

The Carboloy dies used in this operation are made in two halves and are clamped together so that the die can easily be disassembled for regrinding. The carbide punch has a taper towards the center which tends to give the punch more shear, thus providing freer cutting action and greater punch life.

The dies and punches formerly employed for punching these stator laminations gave an average of 46,000 punches before regrinding became necessary. The Carboloy punch and die sets have produced as high as 2,304,000 pieces between grinds. Of even greater importance is the fact that the laminations produced with the carbide sets are entirely free from objectionable burrs. The steel dies quickly start leaving a large burr around the edges of the notches. It is claimed that such burrs make it difficult to stack the finished laminations and may even result in an excessive loss of current in the completed motor.

The jewelry industry, which is a large user of power stamping presses, is making use of carbide die inserts for the stamping and forming of shapes ranging all the way from pins, brooches, links, and

FIG. 5—Carboloy dies for cold nosing 105 mm artillery shells produced up to 3 million shells per die without galling or seizing.

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metal buckles to watch cases and wedding rings. It is interesting to note that production runs on many of these articles attain surprisingly high totals.

Tubing drawn through carbide dies has been increased to at least 6-in. diam from the before-the-war limit of around 3 in. Carbide mandrels of more than 3-in. diam are also in use at the present time. Many of the plants currently using carbide dies and mandrels report that they have been able to increase the linear feet of tubing produced on the draw benches, on an average, from 20 to 30 pct over that obtained with steel mandrels and dies. In addition, production records show that carbide tubing dies permit holding the finished tubes to closer tolerances over longer runs, that they produce a finish superior to that obtained with steel and show a service life ratio which is conservatively estimated at from 20 to 30 to 1 over steel for comparable operations.

An example of drawing large steel tubes with carbide dies which may now be mentioned is in the manufacture of steel rocket tubing. This particular tubing was made of plain carbon steel. The entering size of the tubing was 5 9/16-in. OD. It was drawn down to an OD of 5.035 in. and a wall thickness of 7/32 in. It was cold-drawn through carbide dies at a materially higher speed than could have been obtained with steel equipment. The Carboloy dies produced up to 690,000 linear feet of rocket tubing per die.

Carbide dies have also made possible the economical drawing of thin walled steel tubing, that is to say, tubing only 0.010-in. thick. The drawing of such tubing requires an extremely narrow bearing surface, about 1/16-in. bearing in a 3/8-in. diam die. In a steel die, a bearing surface as short as this tends

to wear away with such rapidity that the drawing operation is uneconomical. Carbide drawing dies with similar short bearing surfaces, however, stand up over long periods of time, thus making the process feasible. See fig. 6.

The use of carbide dies and mandrels is not confined to the drawing of steel tubing, however. A good example is in the production of Naval condenser tubing of cupro-nickel and aluminum bronze. Both of these alloys are so tough that conventional steel mandrels and dies wore out quickly. It was found impossible, with steel dies, to meet war production schedules. Adoption of carbide dies and mandrels, however, increased both the service life of the equipment and the speed at which the tubing could be drawn to a point where it was possible to meet the schedules.

Wartime experience proved the practicality of cold nosing steel with carbide dies. In fact, by V-J Day, carbide cold nosing dies were being so widely used in the shell industry for projectile sizes up to 105 mm that such dies were rapidly becoming standard.

According to reports, the use of Carboloy dies for shell nosing involved no departure in practices, although in most cases slightly more care was exercised in lining up the dies as an additional safeguard to the carbide metal itself.

The nose was formed on the shell by a single stroke of the press, the die being attached to the press ram as shown in fig. 5. Production ranged from 1,000,000 to 3,000,000 shells per die under continuous operation, according to reports covering a period of more than 2 yr. This compares with an average of 50,000 shells per tool steel die. Moreover, the carbide dies did not show the tendency to wear and gall that the steel dies did. Since the initial cost of the Carboloy cold nosing die was only about 5 to 6 times that of a comparable steel die (the carbide nib in the 105 mm shell nosing die alone weighs 45 lb), the increased productivity per dollar of initial die cost ranged from approximately 230 pct to as high as 1100 pct.

High Intensity Light Gives Pin-Point Source

DEVELOPMENT of a new type of electric light with a luminescent source as small as 0.003 in., yet which is claimed to be 1/16 as bright as the sun has been announced in a paper presented by W. D. Buckingham and C. R. Deibert, Electronics Div., Western Union Telegraph Co., New York, at a recent meeting of the Optical Society of America in Cleveland.

Operating upon new principles, the concentrated arc lamp produces a light from a source so small and intense that it is said to provide the nearest approach to a point source yet obtained. With the release of the glass enclosed arc lamp for industrial use, it was predicted that many existing optical devices will produce results formerly thought impossible.

As a source of illumination for microscopes, the new lamp makes possible greater magnification than has been considered possible, without the aid of an electron microscope. It is also a high intensity source of ultraviolet radiation. It may have extensive use in the medical field.

The lamp may be used as a lensless projector and also may be used with optical devices to produce from 5 to 10 times the brilliancy upon a screen with 100 times the life of a normal tungsten projection lamp of similar rating, the authors reported. When it is used with optical devices, the lenses produce exceptionally sharp images having extreme depth of focus, such as would be obtained if the lenses were stopped down to a very small aperture, but without the loss of light which would result from such a procedure.

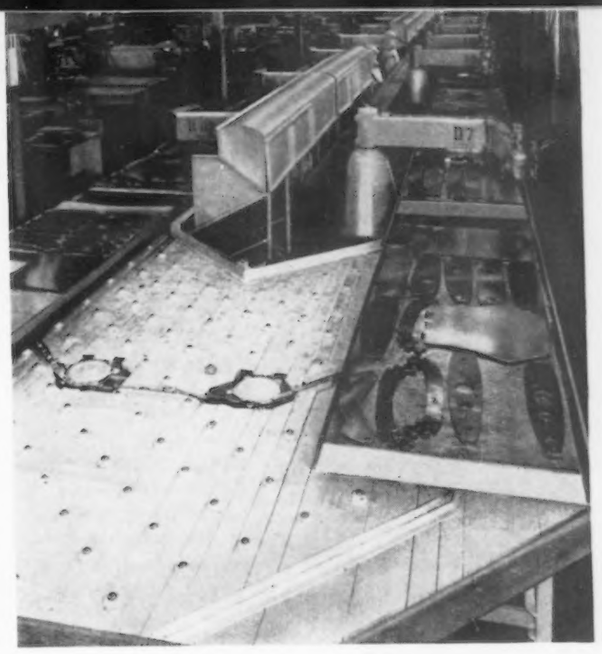
The concentrated arc lamp had its origin before the war and was further developed during the war under a National Defense Research Committee contract. Basically it is an arc lamp provided with permanent electrodes sealed into a glass bulb filled with an inert gas at atmospheric pressure. The source of the light is a sharply defined circular spot which forms on a specially prepared zirconium oxide cathode. The oxide surface is raised to its melting point by ionic bombardment. A brilliant white light is emitted by this molten surface and the cloud of excited zirconium vapor and the inert gas which extends for a few thousandths of an inch from the cathode.

This ionized vapor returns to the cathode, thus renewing the surface and resulting in lamp life of several hundred hours. The portion of the total light which originates from the cathode surface has a gray body type of continuous spectral distribution. It extends from 2500 A in the ultraviolet through the visible, reaching a maximum near 10,000 A and on into the infra-red, until cut off by the glass of the bulb near 5 m.

That portion of the radiation which comes from the cloud of excited vapor and gas shows three principal spectra, a continuum extending from the short ultraviolet to about 5000 A, the normal and singly and doubly ionized zirconium spectrum, and the normal and singly ionized argon gas spectrum. In the various sizes of lamps now made, the light emitting spot ranges from 40 to 100 cp per sq mm in maximum brightness, and from 0.003 in. to several tenths of an inch in diameter.

Concentrated arc lamps operate on direct current and are started with a high voltage which breaks down the gap in the lamps. They may be run from any well-filtered rectifier or generator if sufficient ballast resistance is provided to limit the current to its normal value. Such ballast resistance must always be included in the circuit, for the lamps have a negative volt ampere characteristic.

Conveyor Speeds Sheet Metal Parts Production



GENERAL view of the conveyor line showing the radial arm drills at the right, and the routers at the left. Notice the shields used to deflect router chips onto a belt conveyor for removal.

IN the manufacturing operations involved in fabricating parts from sheet metal, it is generally considered impractical to make use of conveyors. However, North American Aviation, Inc., Inglewood division, has recently installed a conveyor system for the layout, drilling, and routing operations on sheet metal parts, which is believed to be the first of its kind.

Previously the method of fabrication was to lay out the material by placing from 6 to 10 4x12 ft sheets on an A frame truck, wheel this outside, and rough outline the parts on the metal by spray painting through paper templates. The prepared sheets were then forwarded to the appropriate department and stored in racks until needed. From these racks the work was removed manually to the drill table where drill templates were applied and the pilot, tooling, and other holes were stack drilled. At the conclusion of this operation the work was again stored on trucks and in racks to await the routing operation.

For routing, the work was placed on the routing table, templates were applied, and lag screws were driven through templates and material to hold them in place on the plywood topped table. After routing, parts were again placed on trucks and moved to the deburring rolls.

To perform these three operations, heavy, bulky material had to be moved six times and stored four times, and drilling and routing machines were idle more than 50 pct of the time while material was being obtained, set up, and unloaded. Furthermore, the trucks obstructed the aisles to such an extent that through trucking in the departments involved was virtually impossible.

Under the new system, a 22 station intermittently operated conveyor stationizes the various operations at 15 min intervals by moving 14½ ft at a speed of 30 ft per min. At the first station the 4x12 ft sheets are loaded in quantities of 6 to 10 sheets onto a conveyor table by means of an overhead crane, and at the next station these are marked out by spray painting through paper templates. The next four stations are assigned to drilling, lag screwing the material to the table top, applying the drill templates, and pegging these into position by inserting pegs through the drill templates into two previously drilled ¼-in. holes in each part outlined on the material. These pegs serve to secure the drill templates in the proper location.

Pilot, tooling, and all other holes are drilled in the next four positions with high-cycle, pneumatically-fed, radial arm drill presses, after which the drill templates are removed, and router templates applied and attached with lag screws at the next two stations.

In the following seven positions, oddly shaped parts are profiled to size by moving the cutting tool on the high-cycle, radial arm routers around the profile of the templates. These are removed at the third from last station and placed on an overhead conveyor which returns them to the template applying station. Drill templates are similarly returned to their application station on this automatically operating monorail. At the final two stations, parts are removed from the main conveyor and placed on roller conveyors which carry them to the deburring rolls and to the inspection and numbering stations.

To eliminate any safety hazard, an automatic horn is sounded before the main conveyor starts to move, and to dispose of the enormous volume of chips, the routers are equipped with air nozzles which throw the chips against a shield. This deflects the chips onto a belt conveyor which deposits them into a scrap truck. Routers and drills are equipped with a central lubrication system which lubricates the tools, thus increasing production and decreasing tool wear.

Before installation of the conveyor, only 20 tables of parts were produced per 10-hr shift with the aid of 41 employees. The day after the installation was made 38 tables of parts were produced by only 26 employees; a saving of 39,000 man hours per year. In addition to these savings in man hours and the increase in production, the specialization resulting from each employee repetitiously performing the same operation has reduced the drill and router bit breakage, cut down the consumption of plywood and lag screws, and lowered the machine maintenance costs. Furthermore, there will undoubtedly be a substantial saving effected in material through reduction of scrap losses.

Heat Treating

Carburized Sintered Steel

An investigation to determine the effects of various carburizing methods and subsequent heat treatment on the depth, hardness, and microstructure of the case obtained on three different types of sintered steel and cold-rolled steel, is reported herein. The results obtained with the powder metal specimens are very similar to cold-rolled SAE 1015 steel.

By GEORGE STERN and JESSE GREENBERG

Metallurgist and Assistant Metallurgist, respectively, American Electro Metal Corp., Yonkers, N. Y.

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PRESENT DAY powder metallurgy has made possible the production of relatively high strength parts that are capable of competing with machined parts made from low and medium carbon steels and low alloy steels. To duplicate the surface hardness frequently called for in the specifications for such parts, it is necessary to carburize and subsequently quench and draw powder metal steel parts of low carbon content.

While the technique generally employed in such carburizing, quenching and drawing is similar to that employed in regular heat treating, certain special properties of powder metal compacts must be taken into account and procedures modified accordingly to obtain satisfactory results. Furthermore, the case obtained is different both as to structure and depth, and the methods for measuring the hardness of this case must be selected accordingly.

Three different types of sintered steel were used in this study. One was made from reduced iron powder and had a small percentage of copper added. Another was made from electrolytic iron powder, while the third was also made from electrolytic iron powder, but had 1 pct manganese added in the form of ferromanganese.

For purposes of simplicity, the steel from reduced powder is hereafter called R 242, the steel from electrolytic powder S 34, and the steel from electrolytic powder and ferromanganese S 34 + 1 pct Mn.

FIG. 1 — R 242 — As carburized, Nucarb, 1650°F, 1 hr. Picral etch. Entire pack cooled in lime. 200X.

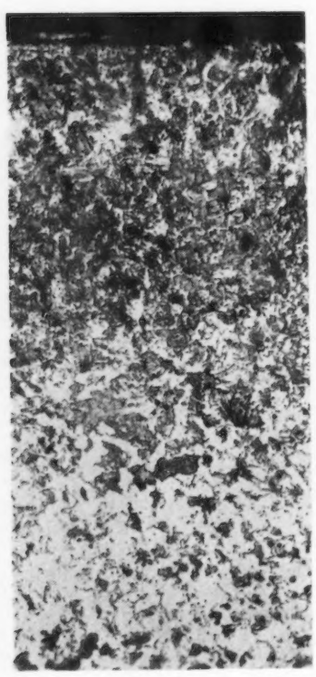


FIG. 2 — R 242 — As carburized, Vapocarb 1650°F, 1 hr. Lime cooled; picral etch. 200X.

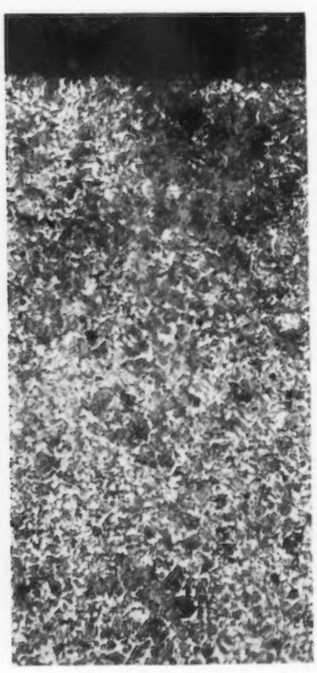
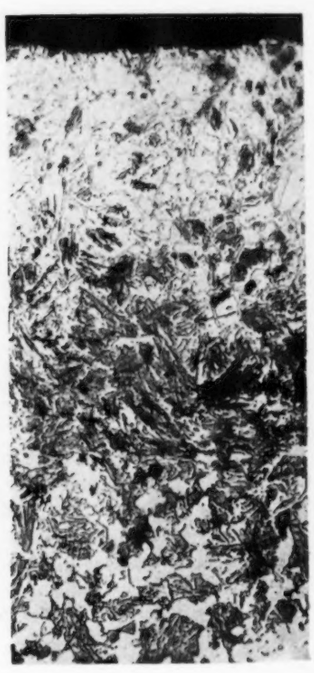


FIG. 3—S 34—As carburized, Nucarb, 1650°F, 1 hr. Entire pack cooled in lime; picral etch. 200X.



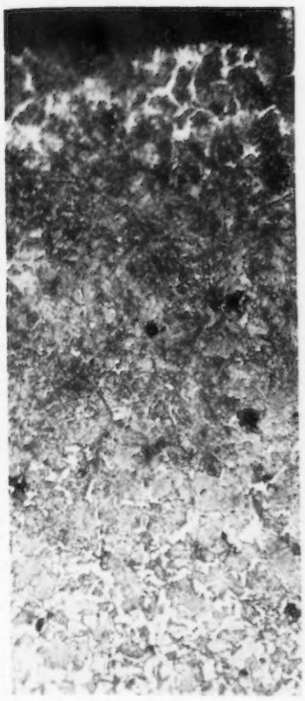


FIG. 4—S 34—As carburized, Vapocarb, 1650°F, 1 hr. Lime cooled; picral etch. 200X.

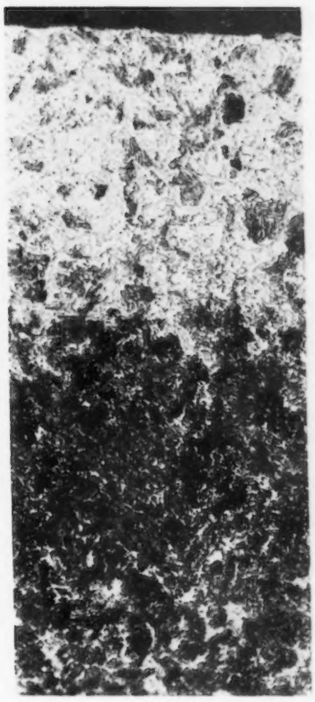


FIG. 5—S 34 + 1 pct Mn—As carburized, Nucarb, 1650°F, 1 hr. Entire pack cooled in lime; picral etch. 200X.

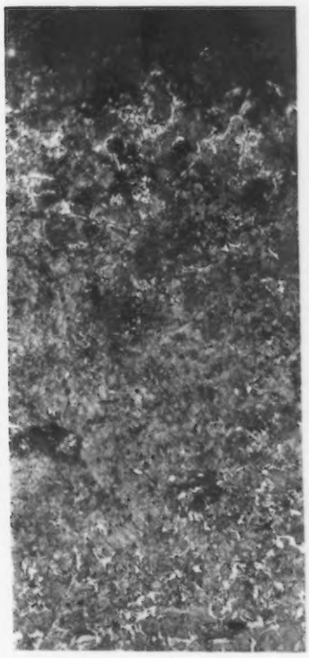


FIG. 6—S 34 + 1 pct Mn—Ac carburized, Vapocarb, 1650°F, 1 hr. Lime cooled; picral etch. 200X.

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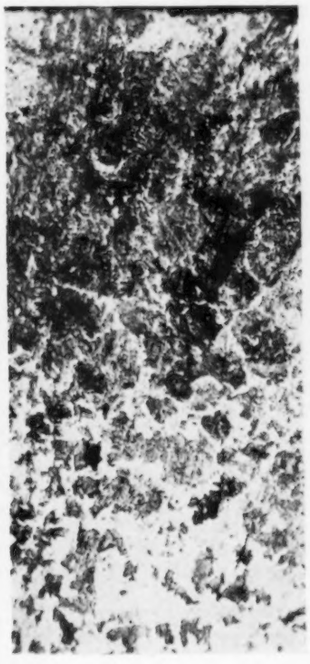
BELOW

FIG. 7—Cold-rolled SAE 1015—As carburized, Nucarb, 1650°F, 1 hr. Entire pack cooled in lime; picral etch. 200X.



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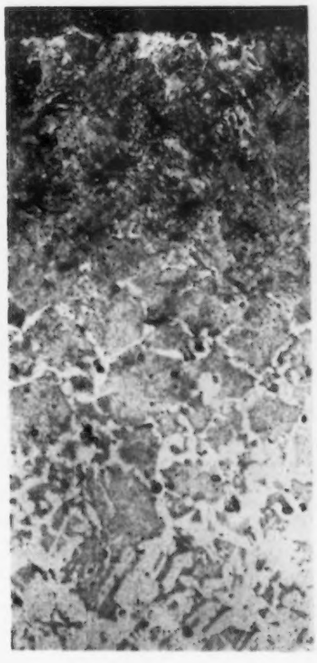
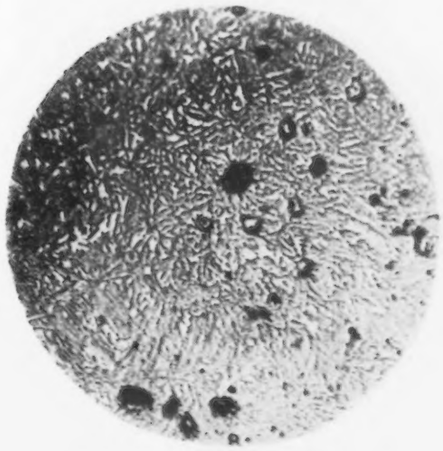
BELOW

FIG. 8—Cold-rolled SAE 1015—As carburized, Vapocarb, 1650°F, 1 hr. Lime cooled; picral etch. 200X.



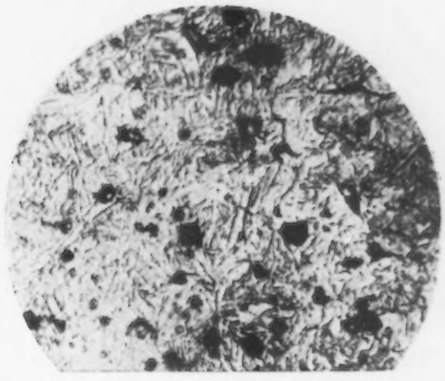


ABOVE

FIG. 9—R 242—Carburized Nucarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.

BELOW

FIG. 10—R 242—Carburized Vapocarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.



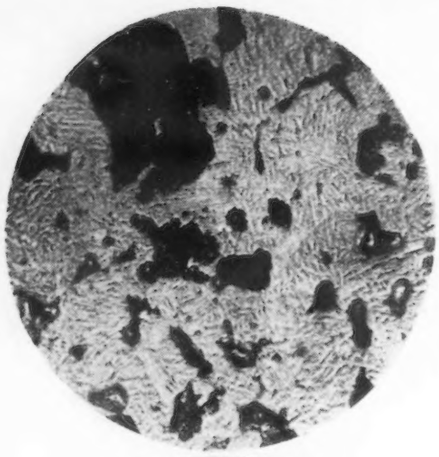


FIG. 11 — R 242 — Carburized Nucarb 1650°F, 1 hr. Oil-quenched from 1550°F. Etched with picral-nital. 1000X.

FIG. 12 — R 242 — Carburized Vapocarb 1650°F, 1 hr. Oil-quenched from 1550°F; etched with picral. 1000X.

FIG. 13 — S 34 — Carburized Nucarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.

FIG. 14 — S 34 — Carburized Vapocarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.

The properties of the sintered steels are given in table I.

Carburizing and Quenching Procedures

Samples for carburizing and quenching were cut from the pressed and sintered bars. These pieces were approximately $\frac{7}{8}$ x $\frac{1}{2}$ x $\frac{1}{2}$ in.

Duplicate samples were pack carburized in a coarse and a fine pack-carburizing compound at 1650°F for 1 hr. Other duplicate samples were gas carburized in a Leeds and Northrup Vapocarb furnace at the same temperature and time. The pack-carburized samples were furnace cooled to room temperature and then reheated in a neutral atmosphere to 1550°F. Duplicate samples were quenched in water and other duplicates quenched in oil.

The Vapocarb samples were cooled, after carburizing at 1650°F for 1 hr in a neutral atmosphere, to 1550°F, and then quenched in either oil or water.

Table II lists the materials used in this study.

In order to compare the type of case, depth and hardness for the sintered steels with a normal steel, a piece of SAE 1015 cold-rolled steel was given treatment identical with those given the sintered steels. Table III summarizes the findings on depth of case for the various steels studied. The table merely lists the depth of case, so to obtain a complete understanding of the difference between the case for powder metal steel and regular steel, the microstructure must be studied.

Microstructure of Case as Carburized

From table III it can be seen that the depth of case is approximately the same for all the steels studied and for all carburizing methods used, except R 242, which definitely has a shallower case (see figs. 1 and 2). The R 242 case is spotty and definitely hypoeutectoid throughout. This might be due to the low density coupled with a low carbon content of the core permitting a high rate of carbon penetration and very little carbon build-up in the case. Furthermore, the spottiness of the case might be attributed to the presence of copper. By comparison the cold-rolled steel having a carbon content to 0.15 pct has a deeper (and hypereutectoid) case for the same carburizing conditions (see figs. 7 and 8).

Both the S 34 and S 34 + 1 pct Mn have hypereutectoid cases (figs. 3, 4, 5 and 6). For the entire pack cooled in lime condition, the cases are quite abnormal due to the high purity of steels and the very slow cooling rate from the carburizing temperature (figs. 3 and 5). The greater depth of case observed for S 34 + 1 pct Mn as compared with S 34 (see table III) can be explained by the greater porosity of S 34 + 1 pct Mn. It has a density of 92.8 pct of theoretical, as compared with 95.0 pct for S 34. While it is true that S 34 + 1 pct Mn had a higher original carbon content (0.49 pct C), it still permitted the carbon to penetrate deeper due to the greater porosity.

The photomicrographs, figs. 9, 10, 11 and 12, show that the water-quenched samples developed a martensitic case whereas the oil-quenched specimens developed a troosto-martensitic structure for the pack carburized samples due to the slower cooling rate. This steel has about 0.50 pct Mn. The structure is quite porous as is to be expected from a 89.4 pct dense material.

The water-quenched samples, figs. 13, 14, 15 and 16,

again reveal a martensitic case, whereas the oil-quenched specimens consist of fine pearlite. The porosity is greatly reduced as compared with R 242. In this case no martensite or fine pearlite (troostite) is evident in the oil-quenched samples, but this can be explained by the complete absence of such elements as Mn and Si.

Figs. 17 to 20 are very similar to figs. 13 to 16. It is interesting to note the small white martensitic patch in fig. 19 in the midst of the fine-pearlitic structure.

In the cold-rolled steel, the case, whether oil or water quenched, is fully martensitic. This is due to the Mn and Si content of this SAE 1015 steel. Although the case as carburized for S 34 and S 34 + 1 pct Mn was hypereutectoid, both these steels lack the necessary alloy content to transform to martensite on oil quenching. This must mean that the 1 pct Mn added as ferromanganese (S 34 + 1 pct Mn) was really not well diffused in the iron during sintering.

From table IV we can conclude the following:

(1) For porous steels like R 242, S 34 and S 34 + 1 pct Mn, the case hardness with a reasonable depth of case (at least 0.010 in.) can be measured on either the Rockwell "15N," "30N" or "A" scales. However, the true hardness value, irrespective of pores can best be obtained with a microhardness or Vickers hardness tester. Although not shown, values obtained with a Rockwell "C" scale are definitely misleading for powder metal materials with a thin case.

(2) The hardness values obtained by oil quenching are comparable with the water-quenched values only for the R 242 and SAE 1015 steels. Both of these steels have at least 0.50 pct Mn and some Si in them, which accounts for their transforming to harder structures on an oil quench.

(3) The hardness value for the oil-quenched S 34 and S 34 + 1 pct Mn are low. This can be explained by the sluggishness of these pure carbon steels in transforming to harder structures on quenching. However, the S 34 + 1 pct Mn is slightly superior in hardness to the S 34 for the oil quench. This indicates some of the Mn did diffuse into the iron.

Discussion of Results

It has been demonstrated that with the sintered steels studied, the depth of case is the same for both pack and gas carburizing. The possible exception to this finding is R 242. If the porosity of the steel and the low carbon content of the core are taken in account, it can readily be seen that the carbon can diffuse rapidly into this particular steel, resulting in a hypoeutectoid case with no sharp demarcation between case and core (see fig. 2). Therefore the accuracy of measuring the case for R 242 is questionable. Figs. 3 and 5 show an abnormal structure in the case. This abnormality of pack carburized steels has been frequently observed for regular steels whereas gas carburized samples of the same materials are normal. A possible explanation for this is offered by Bain,[1] who showed that very pure iron, oxygen-free and carburized in the absence of O_2 is normal, while high purity iron, contaminated by O_2 may show abnormality. It is possible that in our pack carburizing there is a pick-up of O_2. Grossman[3] has shown that there may be a slight pick-up of O_2 in pack carburizing.

The case obtained after carburizing and quenching

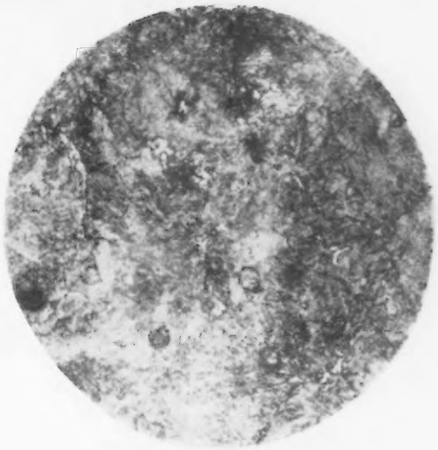


FIG. 15 — S 34 — Carburized Nucarb 1650°F, 1 hr. Oil-quenched from 1550°F; etched with picral. 1000X.

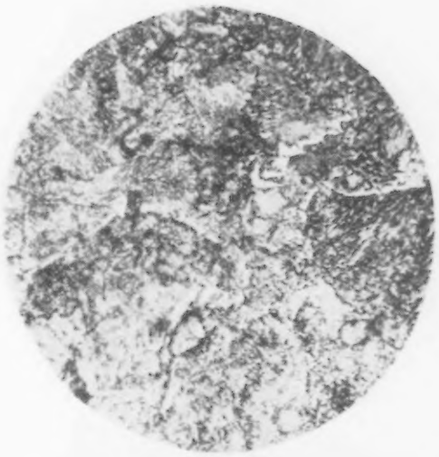
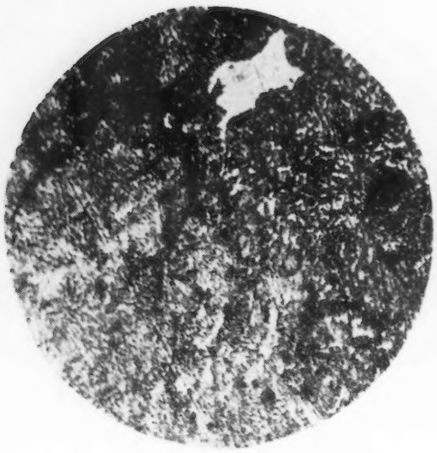


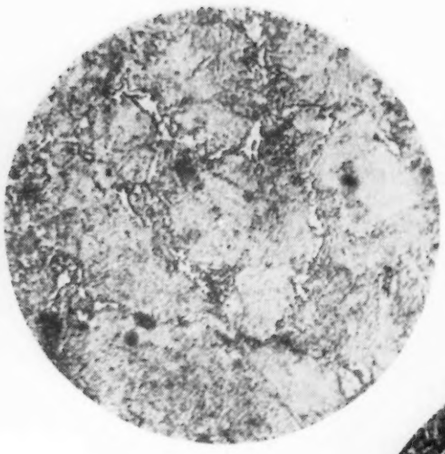
FIG. 16 — S 34 — Carburized Vapocarb 1650°F, 1 hr. Oil-quenched from 1550°F; etched with picral. 1000X.

FIG. 17—S 34 + 1 pct Mn — Carburized Nucarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.

FIG. 18—S 34 + 1 pct Mn — Carburized Vapocarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.



ABOVE
FIG. 19—S 34 + 1 pct Mn—Carburized Nucarb 1650°F, 1 hr. Oil-quenched from 1550°F; etched with picral. 1000X.



ABOVE
FIG. 20—S 34 + 1 pct Mn—Carburized Vapocarb 1650°F, 1 hr. Oil-quenched from 1550°F; etched with picral. 1000X.

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FIG. 21—C.R. SAE 1015—Carburized Nucarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.

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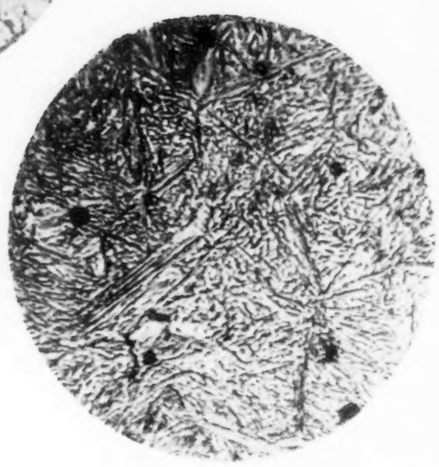
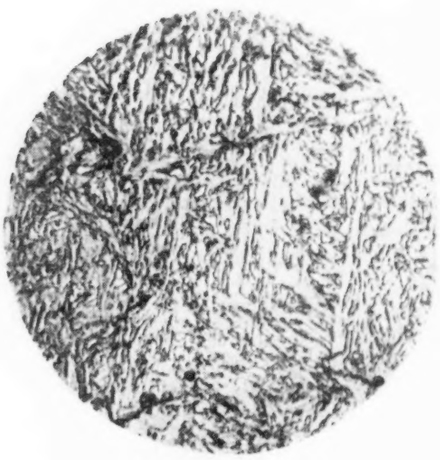


TABLE I

Properties of Sintered Steel

Steel	Final Density, g per cc	Final C, Pct	Final Density (Pct of Theoretical)
R 242	7.02	0.16	89.4
S 34	7.46	0.26	95.0
S 34 × 1 Pct Mn	7.27	0.49	92.8



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RIGHT
FIG. 22—C.R. SAE 1015—Carburized Vapocarb 1650°F, 1 hr. Water-quenched from 1550°F; etched with picral. 1000X.

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TABLE II

Materials Used for Carburizing and Quenching

Material	Description
Coarse Carburizing Compound	Houghton Nucarb No. 3 Mesh
Fine Carburizing Compound	Houghton High Carbon Boneblack No. 10 Mesh
Quenching Oil	Houghton No. 2 Soluble Oil

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RIGHT
FIG. 23—C.R. SAE 1015—Carburized Nucarb 1650°F, 1 hr. Oil-quenched from 1550°F; etched with picral. 1000X.

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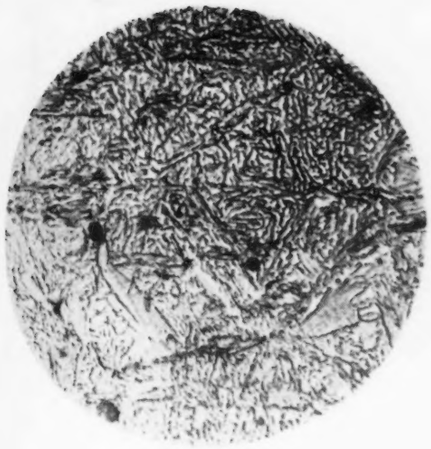
TABLE III

Depth of Case for Various Methods of Carburizing At 1650°F for 1 Hr

Material	Pack Carburized Nucarb, In.	Pack Carburized H. C. Boneblack, In.	Gas Carburized Vapocarb, In.
R 242	0.009	0.008	0.012
S 34	0.012	0.012	0.014
S 34 × 1 Pct Mn	0.015	0.015	0.013
Cold-Rolled SAE 1015	0.013	0.012	0.013



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LEFT
FIG. 24—C.R. SAE 1015—Carburized Vapocarb 1650°F, 1 hr. Oil - quenched from 1550°F; etched with picral. 1000X.

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has been shown to be fully martensitic for all water-quenched sintered steels. The oil-quenched case varied from troosto-martensitic, for the Mn- and Si-containing steel (R 242), to fine pearlite for the other two sintered steels. This is further confirmed in table IV where the oil-quenched R 242 shows an average R 15N reading of 87.5, whereas the S 34 and S 34 + 1 pct Mn readings show a R 15N range of 77.0 to 82.5.

The similarity between pack and gas carburizing is further demonstrated by the hardness readings which are fairly close for both methods, regardless of the hardness measuring scale used. The lower readings for the Vapocarb samples are probably due to a lower carbon content in the case. The various hardness surveys proved that only the microhardness tester gave a true hardness value for the case, whereas the other scales employed (Rockwell "15N," "30N" and "A") indicate only an apparent hardness due to the porosity of sintered steel. Hence the case may be "file hard" even though the apparent hardness is less than 60 RC. This fact cannot be emphasized too strongly, as it clearly demonstrates that most case-hardened powder metal parts are satisfactory for the particular application, even though the Rockwell "C" scale reading may not be up to specifications. Therefore, specifications for powder metal parts should be written for Vickers or microhardness readings with the Rockwell "15N" scale, as a maximum compromise. Microhardness readings indicated hardness values exceeding the core hardness to depths considerably greater than twice the metallographically measured case. Conclusions drawn from these studies are:

(1) Pack carburizing and gas carburizing gave approximately the same depth of case at the same carburizing temperature.

(2) The hardness values obtained on bath pack and gas-carburized samples after quenching were generally similar. Hence either method can be used to obtain a satisfactory carburized case for sintered steel.

(3) The water-quenched sintered steel carburized pieces showed a greater case hardness than the oil-quenched pieces.

(4) The water-quenched pieces had a fully hardened martensitic case, but the microstructure of the oil-quenched sintered steel case varied from troosto-martensite to very fine or emulsified pearlite.

(5) It is recommended that for most reliable values of surface hardness, the Vickers or microhardness tester be used on carburized powder metallurgy parts. However, for practical purposes, the Superficial Rockwell "15N" scale may be used.

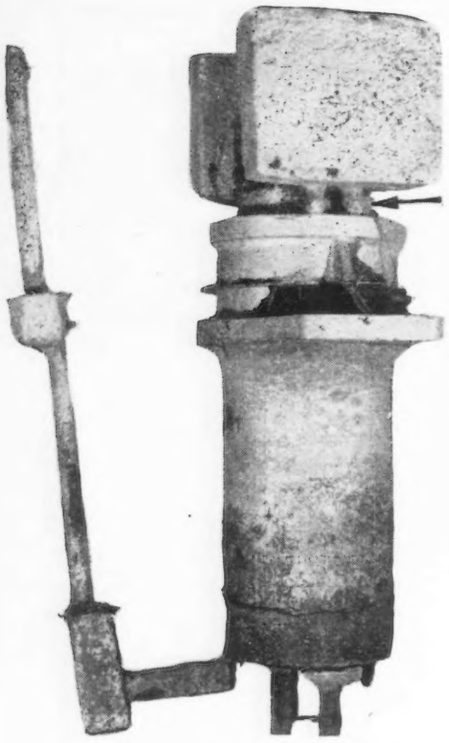
[1] *Bain, E. C., "Factors Influencing the Inherent Hardenability of Steel," Trans. ASST, 20, 1932, p. 385.*
[2] *Grossman, M. A., "Oxygen in Steel," Trans. ASM, 18, 1930, p. 601.*

TABLE IV
Average Surface Hardness of Pack and Gas Carburized Test Pieces—Carburized 1 Hr

Material	Hardness Scale	Water Quenched			Oil Quenched		
		Nu-carb	H. C. Bone-black	Vapo-carb	Nu-carb	H. C. Bone-black	Vapo-carb
R 242	R 15N	88.5	88.0	86.5	87.5	87.5	77.0
	R C*	56	55	52	54	54	34
S 34 + 1 Pct Mn	R 15N	88.5	89.0	85.5	80.0	82.5	69
	R C	56	57	50	39	44	20
S 34	R 15N	89.0	89.5	87.0	79.0	77.0	71.0
	R C	57	59	53	37	34	23
Cold-Rolled Steel	R 15N	93	93	92	90	91	92
	R C	67	67	65	60	62	65
R 242	R 30N	73.5	73.5	....	71.0	69.5	....
	R C	55.5	55.5	....	53	51	....
S 34 + 1 Pct Mn	R 30N	74.0	74.0	....	53.0	55.0	....
	R C	56	56	....	33	35	....
S 34	R 30N	76.0	76.5	....	51.0	51.0	....
	R C	58.5	59	....	30.5	30.5	....
Cold-Rolled Steel	R 30N	83	84	82	77	77	82
	R C	66	67.5	65	59.5	59.5	65
R 242	R A	78.5	78.5	....	74.0	76.0	....
	R C	55	55	....	47	50	....
S 34 + 1 Pct Mn	R A	80.0	80.5	....	66.5	69.0	....
	R C	58	59	....	32	37	....
S 34	R A	81.0	81.5	....	65	64.5	....
	R C	60	61	....	29	28	....
Cold-Rolled Steel	R A	84	86	84	83	83	84
	R C	65	69	65	63	63	65
R 242	Vhn†	885	....	....	....	....	....
	R C	66.5	....	....	....	....	....
S 34 + 1 Pct Mn	Vhn	945	863	....	....	....	....
	R C	68	66	....	....	....	....
S 34	Vhn	868	720	....	....	....	....
	R C	66.5	61	....	....	....	....
Cold-Rolled Steel	Vhn	958	....	....	....	....	....
	R C	68	....	....	....	....	....

* All Rockwell C readings have been converted from the corresponding scales.
† Vickers readings converted from microhardness readings.

▼ ▼ ▼



● Manganese bronze casting weighing 225 lb cast with Thermotomic cores used between the head and the casting. Arrow shows size of feed connection.

A New Feeding Technique For Castings

Use of an exothermically reacting compound in feed gates in ferrous and nonferrous castings to provide better metal feeding into the mold is described herein. Mixing of the compound, its use as core and facing material, and typical applications in roll and bearing casting are also covered.

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By T. E. LLOYD
Pittsburgh Regional Editor

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REDUCED feeder head size, lower cleaning and finishing costs as well as sharply lessened scrap losses are said to result from the use of Thermotomic, a new exothermic material developed by Pittsburgh Metals Purifying Co., Pittsburgh. The material can be molded into core rings for use as feeding rings, or can be mixed with facing material when such an application is desirable.

In practice, Thermotomic, which is available in powder form, in consistency much like sand, is formed into suitable core shapes. Fig. 1 illustrates one type of core in regular use. The concave area around the middle of the core provides a means of locking the core in the gate or head. This particular core is molded into the head basin. When the hot metal passes through it, the reaction is started and the compound in the core glows at a temperature high enough to contribute materially to the heat in the metal in the head, thus delaying solidification of the head and permitting it to feed molten metal to the casting over a longer period of time. This action has materially reduced shrink losses and porosity in such castings as bearings and rolls.

When the burning action is completed and this action can be controlled to range from several minutes up to 60 hr, the core proper remaining shows a hard, refractory structure, retaining its original size and shape. Erosion of the core is negligible. Fig. 2 shows the appearance of the core after the burning action has been completed. The softening point of the burned out Thermotomic core is believed to be in the neighborhood of 3200°F. As a heat source, an independent testing laboratory has reported it capable of generating 3475 Btu's per lb of compound.

Thermotomic is said to impart no impurities to the

FIG. 1—Core containing Thermotomic mixed with the core sand for use in a feeding head. Standard core making and baking methods are used in making the core.

FIG. 2—Core after the compound has been burnt out has a good refractory quality with practically no alteration in size. This core is of different shape than that shown in fig. 1.

RIGHT

FIG. 4—Roll with wabbler cast in the head end. Arrow indicates where Thermotomic ring was placed.

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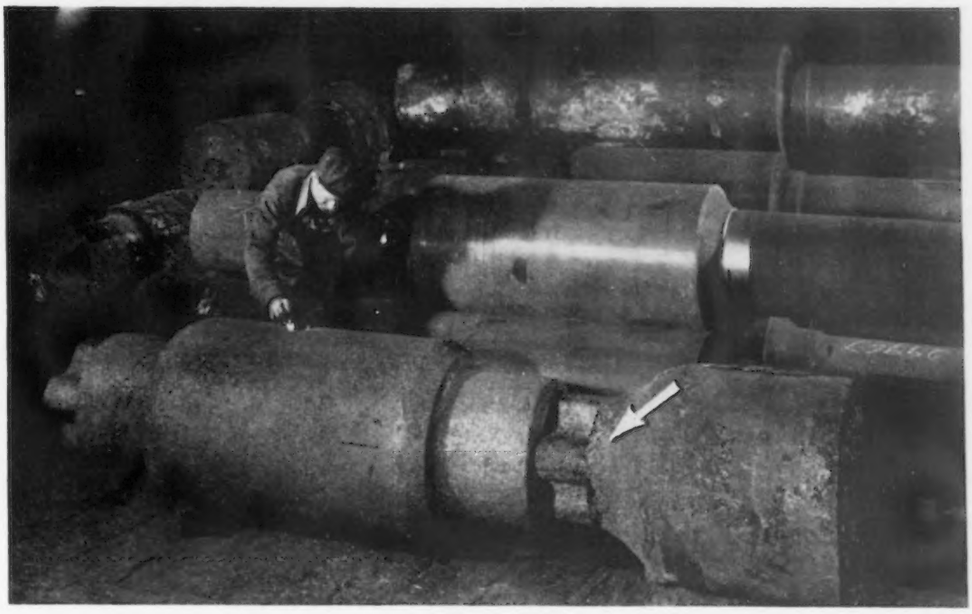
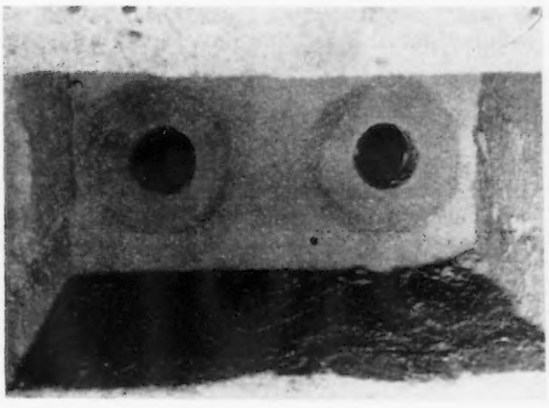
BELOW

FIG. 3 — Head showing core containing the compound in place. The dark outline indicates where core was inserted into the dry sand core of the head.





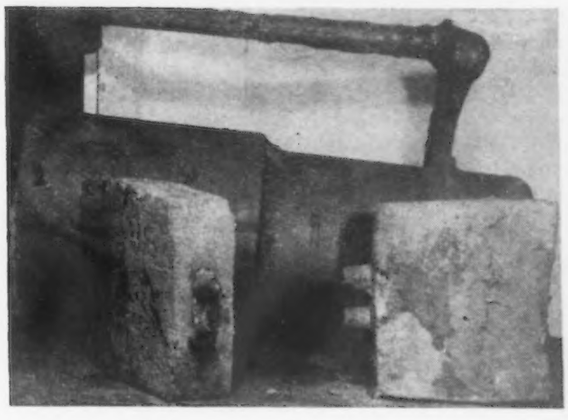


FIG. 5—Typical feeder heads resulting from use of Thermotomic cores in the head. The casting weighs 1200 lb.

metal, and, containing no carbon, sulfur, or phosphorus, does not increase the quantities of these elements in the metal. It has found use in both ferrous and nonferrous work. In forming into shapes, such as cores, Thermotomic is mixed only with water. It is tempered to a consistency of a dry core sand or to a moisture content of 4 to 6 pct. After forming, the core or part is dried in an oven at a temperature of from 350 to 400°F until thoroughly dry. The baking temperature is sufficient to dry out the core completely, but it not great enough to set off the reaction. In a confined area, such as in a feeder head, temperatures in the range of 800°F will initiate the reaction. It has been found that generally no further feeding of the head is necessary after the initial pouring.

In permitting specific areas of a mold to be maintained at temperature sufficient to keep metal liquid, steam, fissures and cracking of fast-freezing sections are eliminated, and since the reaction is not violent, it permits the metal to fill the mold cavity completely. Further, when used as a feeder head, metal in the head is left molten sufficiently long to permit the escape of gases and expedites complete filling of the mold. The need for employing an excess volume of metal in the riser to retain fluidity during feeding is eliminated.

Some 20 foundries have used Thermotomic in cast-

o o o

RIGHT

FIG. 6—This 550 lb aluminum bronze bearing is fed through the 1¼ in. section shown when using the Thermotomic core.

o o o

ing ferrous and nonferrous metals such as various types of bronzes including manganese bronze, Meehanite, 14 pct chrome heat resisting steel, pure copper, aluminum, chrome-nickel steels, and tool steels. One national organization with foundries in some six cities, has adopted the use of Thermotomic in feeder gates as standard practice on certain production in these foundries. One steel roll manufacturer has adopted it as standard practice in casting steel and iron rolls and other heavy steel castings such as platens. Another foundry found that Thermotomic used in feeder gates cut down the thickness of the joint between the head and casting sufficiently to eliminate the need of two large cold saws. A normal 6 or 8 in. diam feeder head is reduced to a 1½ to 2 in. opening at the juncture of the head with the casting, a ring of Thermotomic being used in the mold at the base of the riser restricting the throat. Fig. 3 shows how a core containing Thermotomic is set into the head.

One particularly outstanding example of the use of Thermotomic is in the casting of steel rolls. Heretofore, wabblers could be cast on only one end of a steel roll. The wabbler on the other end had to be machined from the cope and riser of the casting. Through the use of Thermotomic, wabblers have been cast on both ends of the steel roll, as shown in fig. 4. Thermotomic used in this application can be seen immediately beyond the right wabbler, between the cope neck and the wabbler. Considerable machining time is saved by this newer method, since only a finish cut is needed on this roll and it is ready for shipment, and the amount of metal used in the head is sharply reduced, resulting in higher yields. Facing sand with light Thermotomic additions rammed around the wabbler pads to improve further the structure of the metal at that point.

Fig. 5 shows a large copper casting on which Thermotomic was used in the feeder heads. Two rings with 1½ in. openings were used in each of the two heads, and practically broke off as the casting was removed from the mold. A single feeder ring was used in the 550 lb aluminum bronze casting in fig. 6. While the casting itself has been faced, the head and feeder were propped into place to show their relative position. The facing operation on the casting revealed no defects from inclusions, pipe or porosity. The head used on this casting was 9 in. in diam and 12 in. deep. The Thermotomic ring was 1¼ in. thick with a 1¼ in. diam hole. The yield in this particular casting was considerably increased. In another instance, the size of the head was reduced from 10 x 12 in. to 6 x 8 in., with greatly improved metal yield.

The benefits gained from the use of Thermotomic are claimed to be two-fold. First, the ratio of casting metal to finished casting is increased considerably since the feeder head sizes are reduced in volume. This increased metal yield is a direct saving. Second, cleaning and finishing costs are sharply reduced because the diameter of the feeding gate at the point it joins the casting is rarely more than 1½ in. In many instances the heads fall off the castings as they are removed from the mold. When they do not fall off, the heads on iron castings can be knocked off with a sledge, while nonferrous casting gates can be nicked and then removed with a sledge. Sand chipping prior to burning of heads is eliminated and finishing, except in rare instances, is accomplished with a hand grinder because the pads are small.

Because of the consistency of the material, Thermotomic does not have to be segregated from foundry sands. It is highly permeable when burned out and ground, and some foundries have mixed it with their regular sands to increase their permeability.

British Develop Compressed Liquid Spring

CONTRARY to former theories, liquids can be compressed. The Dowty liquid spring, a British wartime development, is said to prove this phenomenon. Technicians of Dowty Equipment Ltd., Cheltenham, England, have, for the first time in engineering history, perfected a liquid spring which operates at pressures up to 100,000 psi. The device should also prove to be an effective method of suspension for drop hammers, oil circuit-breakers, weaving looms and buffers.

The Dowty liquid spring consists of a pressure-sealed cylinder filled with oil and a piston which has a valve mechanism. The piston head is actuated by a piston rod which emerges through a high-pressure gland.

When the piston moves into the cylinder the oil is compressed and is transferred from one side of the piston to the other through the valve which opens fully during compression and closes during recoil. The speed of compression and recovery can be controlled by varying the port apertures in the valve.

No external pressure system is necessary, and the oil in the cylinder initially is not under pressure, but when the piston moves into the cylinder, the piston rod goes with it and, because of the differential volume on each side of the piston head, the oil is compressed. With light mineral oil a compression of no less than 20 pct of the original volume is possible with a pressure of 60,000 psi.

The liquid spring has been made possible by the development of the special gland which permits smooth action under enormous pressures.

The gland is in three main parts. A steel pressure plate, carrying four dowel pins, butts against the cylinder step, and the dowel pins pass through a resilient gland ring into holes in a backing plate. A perforated disk is placed between the gland and pressure plate and so prevents a pressure lock.

In cross-section, the area of the resilient gland is less than that of the pressure plate, due to the dowel holes. Pressure on the plate is thus intensified on the gland, with the result that the resilient gland tends to leak into the cylinder rather than the oil to escape.

Compared with a steel coil spring, the liquid spring shows a substantial saving in size, material and weight; for instance, a steel spring to take a load of 20 tons for 4 in. deflection has a diameter of 10⅝ in. and weighs 125 lb, whereas a liquid spring for the same load weighs 21 lb and is only 3⅝ in. diameter.

The strength and reliability of the liquid spring was demonstrated by a set which, fitted to a Halifax aircraft, survived two crash landings, and was subjected to 500 landings without attention of any kind.

Vacuum-Blast Cleaner Minimizes Dust Hazard

REMOVAL of paint, scale and rust from metal surfaces by abrasive blasting, without the usual flying dirt and abrasive and dust hazards is made possible by the recently introduced Vacu-Blaster unit. This device incorporates in the blasting head an inner nozzle which directs the abrasive under 125 psi pressure onto the surface to be cleaned, while an outer cone surrounding this inner nozzle is connected to a suction hose which exhausts the spent abrasive and loose paint or rust into a reclaiming tank where the usable abrasive is separated from the fines and returned to the abrasive supply tank. The accompanying photo illustrates the Vacu-Blaster being used to clean through five layers of paint on a stainless railroad car. A bristle brush on the blasting head serves to contain the cleaning action and assists in cleaning corners, rivet heads and lapped joints.

Developed by the Vacu-Blast Co., Burlingame, Calif., the nozzle can be easily controlled by one man. Mild paint, scale and rust can be removed from steel, according to the company, at the rate of 2 sq ft per min at an overall cost of 2.78¢ per sq ft. Paint on concrete and stone can be removed at the rate of 3 to 5 ft per min at a cost of 1.39¢ per sq ft. Abrasives such as steel grit and Aloxite can be used, with the suction line and reclaiming tank providing reclamation of 99 pct of the unused abrasive and separation of dust and fines. This system provides continuous recycling of the abrasive until it is worn out.

The Vacu-Blaster is being successfully used, the company reports, to remove paint, scale and rust from decks and other steel surfaces of ships and has been approved and recommended for this use by West Coast Navy yards. Blasting brewery tanks preparatory to recoating is another use. Tank work of all kinds is made easier for the worker by the elimination of the dust and flying abrasive hazard.

VACU-BLASTER cleaning five layers of paint from stainless steel surface of a railroad car. Small hose feeds the abrasive under pressure, while large line sucks the spent abrasive, dust and chipped paint to a reclaiming tank. Control valve is shown near operator's left hand.

The Vacu-Blaster is said to be able to blast concrete down to the aggregate so that newly laid concrete may form a bond with the old. Cleaning metal surfaces prior to welding is another interesting use for this unit, as it may be moved along the line of the weld just in front of the welding operator. This unit also permits, by virtue of elimination of the dust hazard, use for cleaning in close proximity to other machinery without the usual interruption to nearby operations.

One of the factors in the low cleaning costs possible with this device is said to be the elimination of cleaning up after blasting and the fact that only one man is required to operate the machine.

The abrasive supply tank carries 250 lb of abrasive and feeds this into the blasting hose. The reclaiming tank is so located that by push button operation the supply of reclaimed abrasive can be dumped into the abrasive supply tank. Fines pass into a dust collector. The head weighs 3¼ lb and is equipped with tungsten carbide nozzles. The gun may be used with efficiency 25 ft from the pressure tank, while the pressure tank in turn may be located several hundred feet from the dust collector and vacuum unit.

Vibra-Cushioned Face Mill

A NEW line of standard Vibra-Cushioned face milling cutters with carbide tipped inserted blades has been introduced by Tungsten Carbide Tool Co., 2661 Joy Road, Detroit 6. Outstanding feature of the cutters is that they combine the advantages of both inserted blade and fixed blade type of cutters for steel milling.

The cutters are double-cushioned to decrease vibration and the carbide tips on the blades are extra thick in order to give maximum strength. Next, a round type of steel blade, providing more effective backing for the tip, is used. The blade is wedge-locked into a cutter body, which, in addition to being slightly heavier than conventional milling cutters as to total weight, has the weight distributed in such a manner as to provide the maximum of flywheel effect, contributing to smoothness of cutting action.

Use of inserted round blades has made possible designing the cutter body without external slots as is the case in most inserted blade type cutters. Elimination of these slots, with their tendency to let the blade give under pressure, is said to impart a high degree of rigidity, simulating a solid cutter. Use of a wedge-lock for individual blades together with a screw adjustment at the base of the blade permits infinitely fine adjustment of the blade as to height above the cutter body.

Ni Span

By W. A. Mudge and A. M. Talbot*
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New York

Characteristics and uses of three recently developed age-hardenable iron-nickel-titanium alloys of the Invar and Elinvar types, amenable to conventional fabricating processes are described herein. This series of alloys encompass low-thermal expansion, high-thermal expansion and constant-modulus types.

THE pioneer work of Guillaume on Invar[1] is the basis for an important and extensive development in alloys which have controllable coefficients of expansion and which are, therefore, suitable for metal-to-glass sealing and thermostatic materials. Modifications of the original 64 pct iron and 36 pct nickel composition have been made and include principally: (1) Modified Invars, which contain 42 pct and 50 pct Ni; (2) Elinvar,[2] which is an Invar containing Cr to secure a constant modulus of elasticity over a definite range of temperature or specific values of the thermoelastic coefficient, and (3) modified Elinvars, such as the Iso-Elastic alloy,[3] which is Elinvar containing principally Mo to provide specific constant modulus characteristics. In all of these alloys, high strength and, to a lesser extent, the desired expansion and thermoelastic characteristics are obtained by cold working, often as great as 90 pct or more.

A recent and outstanding advancement is the development of age-hardenable, Fe-Ni-Ti alloys of the Invar and Elinvar types which can be fabricated readily and, with cold working of the order of 35 pct to 50 pct followed by aging, can be produced to have desirable expansion and thermoelastic characteristics with increased strength and hardness. Such improvements enable a much wider application of these alloys than was formerly possible.

These new alloys were described first in 1939 by N. B. Pilling and A. M. Talbot[4] of the research laboratory of International Nickel Co., Inc. The materials are known commercially as the Ni-Span† alloys and are available in three principal groups:

(A)—*Ni-Span Lo 42, Ni-Span Lo 45 and Ni-Span Lo 52*—three low thermal-expansion alloys

(B)—*Ni-Span Hi*—a high thermal-expansion alloy

(C)—*Ni-Span C*—a constant-modulus alloy

The chemical compositions of the alloys are given in table I. Nominal mechanical properties are summarized in table II.

Considering the effect of composition upon properties, the addition of titanium to the austenitic Fe-Ni and Fe-Ni-Cr alloys renders them susceptible to age hardening by an appropriate double thermal treatment, such as cooling rapidly from approximately 1800°F and reheating at 1100°F to 1350°F, or even simply by cooling at a slow rate from a high temperature. Age hardening results from the precipitation of an intermetallic compound of nickel and titanium.[4]

The effect of titanium on the age-hardening temperature and hardness of Ni-Span Lo 42 is shown graphically in figs. 1 and 2. Similar results are obtained with the other low-expansion alloys and with the high-expansion and the constant-modulus alloys. Changes in mechanical properties parallel the changes in hardness. The temperatures for solution treatment

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† *Ni-Span is a trade mark of the International Nickel Co., New York. The alloys covered by this name are protected by patents issued and pending.*

TABLE I

Range of Chemical Composition of Ni-Span Alloys

Alloy	Chemical Composition, per cent									
	Ni	Ti	Cr	C (max)	Mn	Si	Al	P (max)	S (max)	Fe
Ni-Span Lo 42	40.5–42.5	2.2–2.6	.....	0.06	0.3–0.6	0.3–0.8	0.4–0.8	0.04	0.04	bal.
Ni-Span Lo 45	44.5–46.5	2.2–2.6	.....	0.06	0.3–0.6	0.3–0.8	0.4–0.8	0.04	0.04	bal.
Ni-Span Lo 52	51.0–53.0	2.2–2.6	.....	0.06	0.3–0.6	0.3–0.8	0.4–0.8	0.04	0.04	bal.
Ni-Span Hi	28.0–30.0	2.2–2.6	8.0–9.0	0.06	0.3–0.6	0.3–0.8	0.4–0.8	0.04	0.04	bal.
Ni-Span C	41.0–43.0	2.2–2.6	5.1–5.7	0.06	0.3–0.6	0.3–0.8	0.4–0.8	0.04	0.04	bal.

and for aging must be increased as the Ti content is increased. Certain compensating adjustments must be made for the effect of Ti upon the basic Fe-Ni alloy to obtain the desired physical properties in the age-hardenable alloys. These adjustments are related to two facts: (1) Carbon in the alloy neutralizes four times its weight of titanium as a result of the formation of a very stable inert carbide, TiC, and, (2) the titanium which does not form a carbide neutralizes more than twice its weight of Ni by the formation of an intermetallic compound.

Thus, extra Ni must be added to the alloy to replace that which has combined with Ti; for each pct of non-carbidic Ti, 2.4 pct Ni are required. Increasing Ti in the Ni-Span Lo alloys lowers the inflection temperature, as shown in fig. 3. Increased Ti in the Ni-Span C alloy moves the thermoelastic coefficient towards the negative value. Only minor changes in expansivity of the Ni-Span Hi alloy results from variations in Ti content.

Carbon is held to a maximum of 0.06 pct to conserve Ti and to assure good response to age hardening. Higher C decreases the aged hardness and has the opposite effect of increasing Ti on the physical properties of the various alloys.

Chromium is the element used for adjusting the thermoelastic coefficient to the value desired in Ni-Span C and to stabilize the austenite in the Ni-Span Hi. The Ni-Span Lo alloys do not contain Cr. Cr affects the thermoelastic characteristics of Ni-Span C in the same manner and to the same degree as Ti. It also increases slightly the rate of work hardening and decreases the response to age hardening. The higher the Cr for a given Ti content, the lower will be the aged hardness and the higher will be the cold-worked and cold-worked plus aged hardness.

In the three Ni-Span Lo alloys, Ni causes the same changes in inflection temperatures and expansivity as in the Ti-free alloys, but at a higher Ni level, as is shown in figs. 3 and 4. Increasing Ni content also results in a lower hardness for a given Ti content, and in an increase in the temperature for maximum hard-

TABLE II

Nominal Mechanical Properties of Ni-Span Alloys

Alloy	Condition			Mechanical Properties						
	Solution Treated	Cold Working, Pct	Aging	Proportional Limit, Psi	Yield Strength 0.2 Pct Offset, Psi	Tensile Strength, Psi	Elongation in 2 In., Pct	Hardness Brinell, 3000 kg.	Tensile Modulus of Elasticity 10^{-6} Psi	Torsional Modulus of Elasticity, 10^{-6} Psi
Ni-Span Lo 42	Yes	No	No	20,000	40,000	90,000	32.0	140	21.0	
	Yes	No	Yes	65,000	120,000	165,000	14.0	330	22.0	
	Yes	50	No	70,000	115,000	130,000	3.0	240	22.5	
	Yes	50	Yes	110,000	165,000	195,000	5.0	385	23.0	
Ni-Span Lo 45	Yes	No	No	Slightly lower than Ni-Span Lo 42						
	Yes	No	Yes							
	Yes	50	No							
	Yes	50	Yes							
Ni-Span Lo 52	Yes	No	No	15,000	35,000	85,000	27.0	125		
	Yes	No	Yes	55,000	95,000	120,000	17.0	305	22.0	
Ni-Span Hi	Yes	No	No	20,000	35,000	80,000	30.0	140		
	Yes	No	Yes	60,000	95,000	150,000	20.0	305	25.0	
	Yes	50	No	60,000	120,000	140,000	4.0	250	24.5	
	Yes	50	Yes	80,000	130,000	180,000	8.0	370	26.0	
Ni-Span C	Yes	No	No	15,000	35,000	90,000	40.0	145	24.0	
	Yes	No	Yes	65,000	115,000	180,000	18.0	345	26.5	10.0
	Yes	50	No	55,000	130,000	135,000	6.0	275	25.5	
	Yes	50	Yes	105,000	180,000	200,000	7.0	395	27.0	10.0

TABLE III

Effect of Nickel Content on Aging Temperature for Maximum Hardness in Ni-Span Lo Alloys

Alloy	Nickel Pct	Optimum Aging Temp., °F	Hardness, Brinell 3000 kg
Ni-Span Lo 42...	42	1225	330
Ni-Span Lo 45...	45	1250	320
Ni-Span Lo 52...	52	1300	305

TABLE IV

Recommended Aging Conditions for Maximum Hardness

Temp., °F.	Hours at temperature for	
	Solution-treated Material	Solution-treated and Cold-worked Material
1100	48	3 to 4
1200	24	3 to 4
1250	24	3 to 4
1300	9 to 12	1
1350	3	1

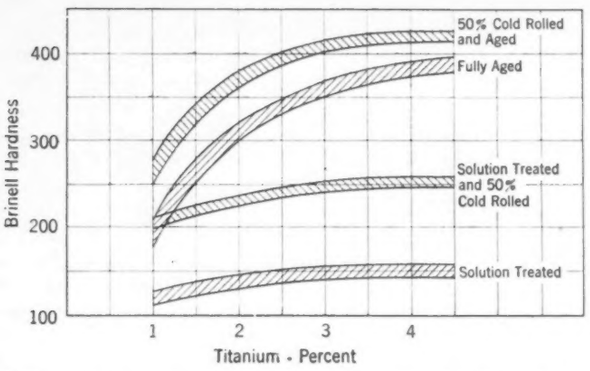

FIG. 1—Influence of titanium on the hardness of Ni-Span Lo 42 alloy.

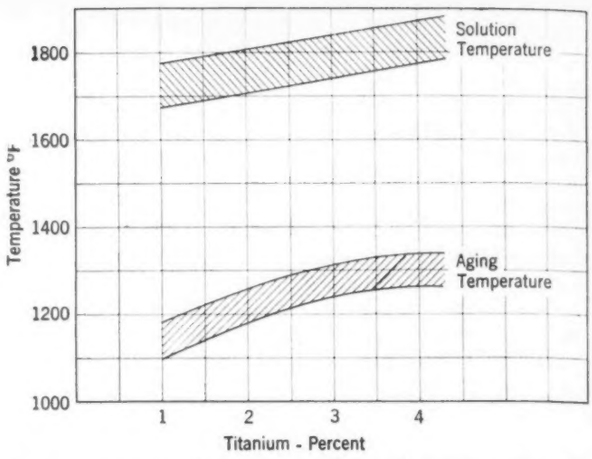

FIG. 2—Influence of titanium on solution temperature and age-hardening temperature of Ni-Span Lo 42 alloy.

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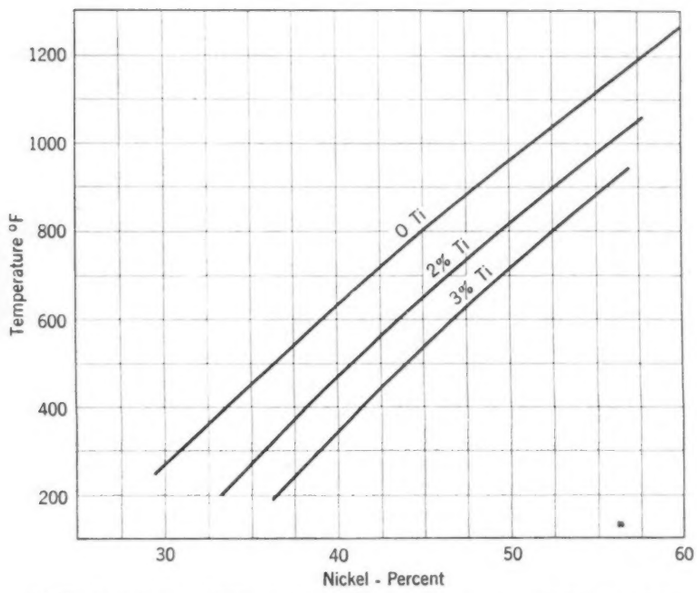

FIG. 3—Influence of titanium on inflection temperature of Ni-Span alloys containing varying amounts of nickel.

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are not desired. In no case, however, is it possible to obtain the exact expansion characteristics for all temperatures in a Ti-containing alloy as are obtained in a Ti-free alloy. If the minimum expansivities are the same, the Ti alloy will have a lower inflection temperature. If the inflection temperatures are the same, the Ti alloy will have a higher rate of expansion. In most cases, it is desirable to compromise between expansion rate and inflection temperature. Fig. 5 demonstrates how closely the properties of the Ti-free alloys may be approached at three different Ni levels for the temperature range of 0°F to 1000°F.

Softening is accomplished by heating at 1700°F to 1850°F, depending upon composition, and cooling rapidly in water or oil. The treatment is not particularly critical but, for best results, the alloy should be at temperature for 20 to 90 min depending upon the size. Fully annealed material has a Brinell hardness of 125 to 150.

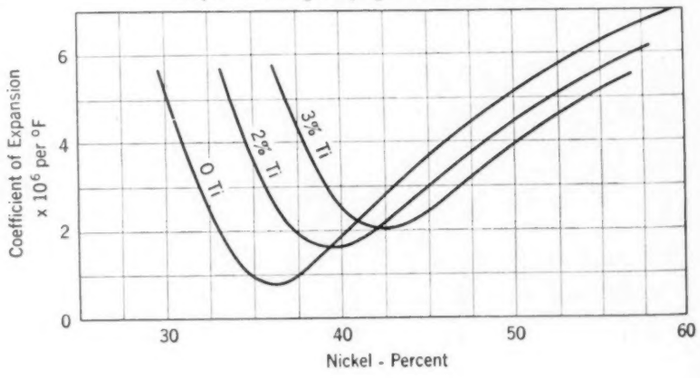
Hardening is accomplished by heating at 1100°F to 1350°F for 3 to 24 hr, depending upon composition and the amount of previous cold work. The Ni-Span Lo alloys should be

ness in aging, as shown in table III. Minor Ni variations have little effect on the properties of the Ni-Span Hi and Ni-Span C alloys.

Of minor elements, Mn is controlled to approximately 0.4 pct and P and S are kept as low as possible to improve forgeability. Si and Al are introduced with Ti addition and are present in amounts of from 0.3 to 0.8 pct. Variations in the amounts of these five elements within the ranges shown in table II do not unduly affect the critical properties of the five alloys.

It is possible to obtain a Ti-containing alloy with the same expansivity as a Ti-free alloy for temperature ranges below the inflection temperature of the alloy involved, providing the very lowest expansion rates

FIG. 4—Influence of titanium on minimum coefficient of expansion of Ni-Span alloys containing varying amounts of nickel.



quenched from the aging treatment for minimum expansion characteristics, while air or furnace cooling is used with the Cr-containing alloys. The latter method is used if minimum residual stresses are required. Examples of aging periods are given in table IV. In the aging of the Ni-Span C alloys it is possible to vary the thermoelastic coefficient by varying the aging temperature. Increasing the aging temperature moves the thermoelastic coefficient in the positive direction.

Conditions of internal stress resulting from cold working and from quenching following aging, lower appreciably the minimum coefficient of expansion of the Ni-Span Lo alloys. This improved low-expansion characteristic, resulting from an internally stressed condition, is retained only if the material is not heated for prolonged periods above 350°F.

Although the five alloys discussed in this article possess a high degree of resistance to corrosion, particularly the two alloys which contain Cr, they are not completely rust-resistant or stainless and will oxidize in moist air, but much more slowly than ordinary steel. The Ni-Span Hi alloy has the greatest corrosion resistance.

Forging and hot-rolling are carried out at temperatures of 2100°F to 2200°F. The lower side of the range is preferable for the initial forging of ingots. The material should be at tne forging temperature sufficiently long to insure an even temperature throughout. A finishing temperature of about 1600°F to 1800°F is recommended to insure a fine-grained structure. The alloy may be effectively solution treated by quenching directly from any hot-forming operation that has finishing temperatures above about 1750°F. Material so treated will have, after aging, improved tensile properties over those obtained by the normal solution treatment and aging.

Cold forming of these alloys should be accomplished before the final aging treatment and may be done by the usual methods. While it is possible under certain conditions to carry out cold reductions of about 85 pct, it is usually found desirable to re-anneal material after a 60 pct reduction. Wire-drawing methods similar to those used for Monel are adequate.

Machining operations should be carried out on material in the hot-rolled, annealed or cold-drawn condition. The alloys are tough and require care to prevent overheating, which might adversely affect their physical properties. A soluble oil and water coolant should be used with cast nonferrous and cemented carbide tools, while a sulfur-base cutting fluid should be used with high-speed steel cutting tools.

Ni-Span Lo alloys are ferromagnetic up to their inflection temperatures, through which range they become less magnetic as the temperature is raised and, finally, become non-magnetic. Ni-Span C alloy is ferromagnetic at room temperature, but goes through a gradual magnetic transformation at 150°F to 400°F, depending upon the Cr content. As Cr content is increased, the range of magnetic transformation approaches room temperature and the alloy is only weakly magnetic. Ni-Span Hi alloy is austenitic and consequently non-magnetic at all temperatures.

The three Ni-Span Lo alloys have the unusually low-expansion characteristics of the Fe-Ni alloys, which make each of them valuable for many industrial uses. These characteristics are covered in fig. 5. Ni-Span Hi alloy has a coefficient of expansion that is near the maximum known for a ferrous-base alloy (approximately 11 x 10^{-6} per °F.) The mean coefficient between room temperature and 1000°F is usually about 10.5 x 10^{-6} per °F. The coefficient is not constant throughout this range; it is usually lower, about 10 x 10^{-6} per °F, at the lower temperatures, and may reach

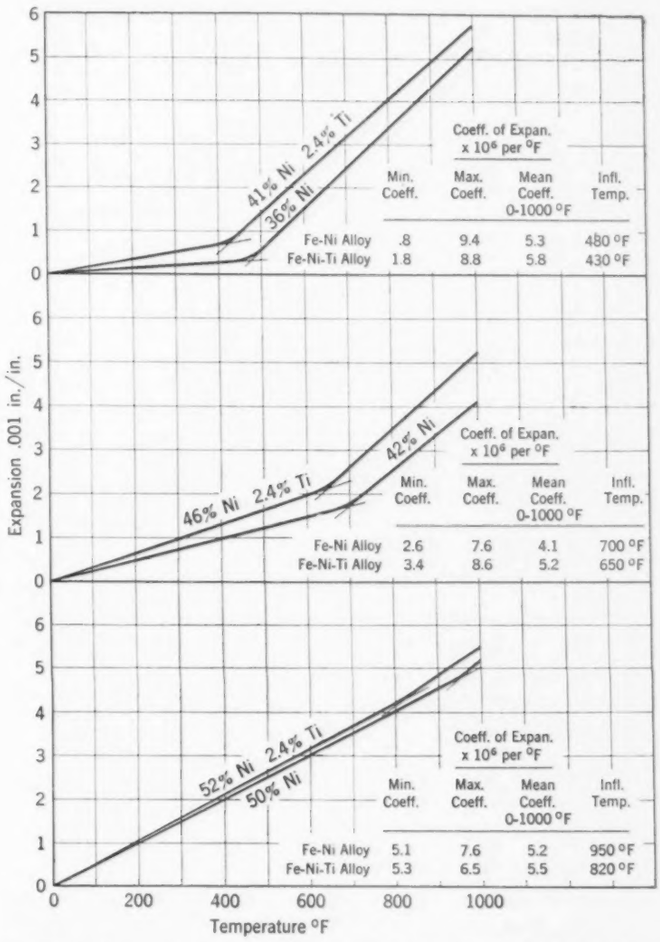


FIG. 5—Comparison of expansion characteristic of three titanium-free Fe-N alloys with three comparable Ni-Span Lo alloys containing 2.4 pct Ti and 0.06 pct C.

a value of 11 x 10^{-6} per °F at the higher temperatures. Material that has been cold-worked and aged will show a slightly lower coefficient than material that has been aged only.

The Ni-Span C alloy has low thermal expansion characteristics. The expansion coefficients at room temperature are within the range 3.8 to 4.0 x 10^{-6} per °F, while at temperatures of 150°F or higher they may increase to 6 x 10^{-6} per °F or higher, depending on composition.

Ni-Span Lo alloys are used in applications requiring a low coefficient of thermal expansion and high strength. A common application is one of the elements in bimetal strip used in thermostats. They are also used in instruments and in other equipment where low-expansion components are essential, such as measuring tapes, special springs, instrument frames, glass-

to-metal seals and machine parts.

Ni-Span Hi alloy is used primarily for thermostatic controls, usually as one element of a bimetal. The second element of a bimetal should be one of the low-expansion, precipitation-hardening alloys. It is used also in combination with other high-expansion alloys where similar expansion rates are required. The advantages of the precipitation-hardening alloys in this application are added strength, resistance to thermal and mechanical shock, and improved properties at elevated temperatures.

Ni-Span C alloy is used primarily in instruments and machines for parts which must have no change or a controlled change in elastic characteristics with changes in temperature. The Ti-containing alloys broaden the use of such materials by having greater strength than was available formerly and by having a more adjustable thermoelastic coefficient. Specific uses include springs for accurate scales, tuning forks, bourdon tubes, diaphragms for altimeters, strain gages and proving rings.

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[3] "New Spring Formulae and New Materials in Precision Spring Design," M. F. Sayre and A. V. DeForest, Trans. A.S.M.E. 58, 379-87 (1936).

[4] "Dispersion-Hardening Alloys of Nickel and Iron-Nickel-Titanium," N. B. Pilling and A. M. Talbot, ASM Symposium on Age Hardening of Metals, 231-57 (1939).

Scanner Reduces X ray Distortion

AN X ray scanner, an accessory developed for use with Searchray 150 X ray units, which overcomes distortion and displacement that is present in conventional methods of X ray image recording, has been developed by North American Philips Co., New York. X rays cannot be focussed, as can light, to give a parallel beam. The rays diverge to produce inaccuracies of greater or lesser degree, depending on the relationship of the particular film area to the X ray source.

The scanner unit, fig. 1, consists of a motor-driven table on which the specimen and film move beneath an adjustable slit through which the X rays pass, shown in fig. 2. Table speed is ½ to 1½ in. per min and can be adjusted to suit each particular application. The scanner is said to record precisely the geometric relationship of integrated components and spacings of segmented specimens.

The scanner is expected to find use particularly in the manufacture of vacuum tubes, capacitors, switches, breakers, timing devices, storage batteries, and other precision assemblies where space measurements are desirable after parts are integrated. When fine grain X ray film is used enlargements may be made for more accurate determination of element position and condition. This can serve to check component changes after certain periods of service. The scanner may also be applied to determine accurately the unknown thickness of material and to study intergranular structure of metals and plastics.

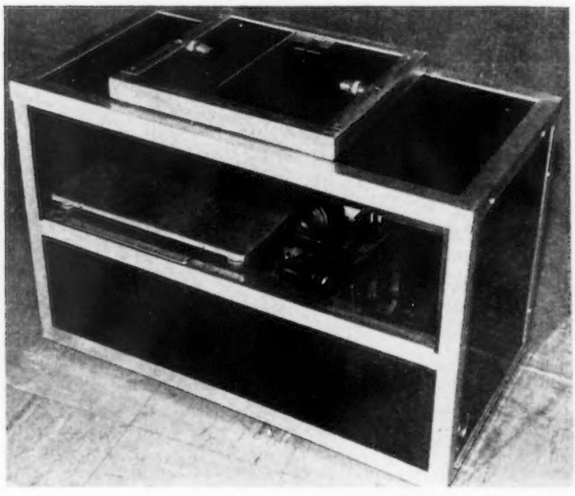


FIG. 1—X ray scanner showing adjustable slit (top) and movable specimen table below.

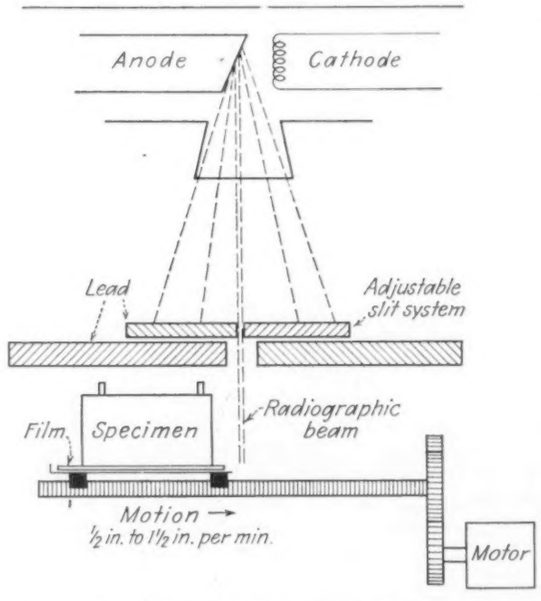


FIG. 2—Sketch shows principle of operation of the scanner slit is adjustable to suit varying inspection conditions.

New Equipment . . .

Machine Tools

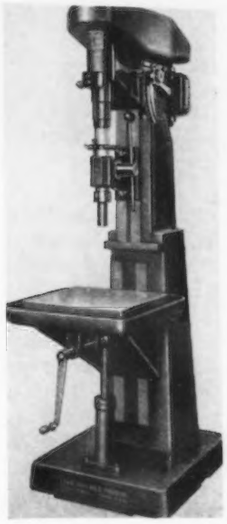
. . . In this week's issue are described interesting developments in machine tools, including drilling machines, milling machines, vertical turret lathes, carbide tool grinders, horizontal tapping machines, broaching machines, and various other machines.

A SPECIAL purpose machine utilizing five standard hydraulic power units and one lead screw tapping unit has been an-

nounced by *LeMaire Tool & Mfg. Co.*, Dearborn. It is claimed that this machine drills, reams, bores, counterbores, chamfers, and taps wheel cylinders all at one setting at a rate of approximately 840 pieces an hr. Four parts are held at one time in each fixture by being clamped by air cylinders and are released by cam rail. Brackets mounted on each end of fixture contain two bushings which nest pins on bushing plates of drill units and head of tapping unit to assure positive alignment.

Drilling Machine

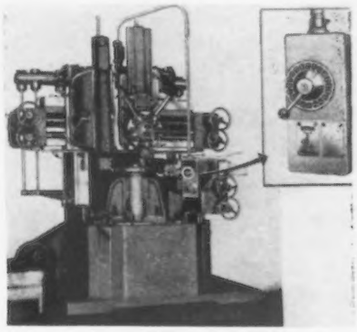
A DRILLING machine with advanced design features, has been announced by *The Taylor & Fenn Co.*, Hartford 1. In this machine is incorporated an instant change variable speed unit, and it is said to be as simple as it is efficient. By merely moving the dial setting in conformity to a handy reference chart mounted in front of the spindle, the exact speed for the drill used in any given material is obtained. No rotating parts in these machines require lubrication, and all bearings are sealed and self-lubricated and are claimed to be of the highest precision type. Expressed in the design is a need long felt in drilling equipment, inasmuch as it does away completely with the nuisance of belt changing and the



consequent almost invariable compromise on speed.

Lathe Pendant Control

AN OUTSTANDING and exclusive feature of all Bullard cut master vertical turret lathes is the Pendant Control, announced by *The Bullard Co.*, Bridgeport 2, which is said to provide a high degree of control and operating efficiency. A swinging arm carrying the pendant is mounted on top of the machine high enough to permit full clearance of vertical heads when they are in maximum high position. The pendant is located at a convenient operating height. The arm may be swung from the right

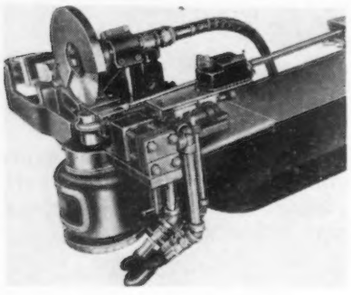


side of the machine to any convenient point over to the left side of the machine, thereby, it is claimed, giving full operating control at all times. There are many cases which require jogging of the table for positioning and indicating purposes. This is very easily accomplished through the use of the switch lever which will jog and position the table for any fraction of a revolution.

Automatic Cut-Off Device

AN AUTOMATIC cut-off for all six sizes of Pines automatic tube and pipe benders which handle tubing from ¾ to 5 in. OD and pipe up to 4 in. OD, has been announced by *Pines Engineering Co.*, Aurora, Ill. This bender is said to be equipped for full automatic manufacture of return bends or elbows. In operating the bender, a long piece of tubing is placed over the mandrel and the start button pressed. After the machine finishes the bend, the mandrel is

extracted and before the clamps are opened, the saw is passed through the tube by means of hydraulic power. The bending arm then returns and the mandrel advances. The tube is then fed automatically and the operation repeats. The



machine continues to operate automatically until the tube is used up.

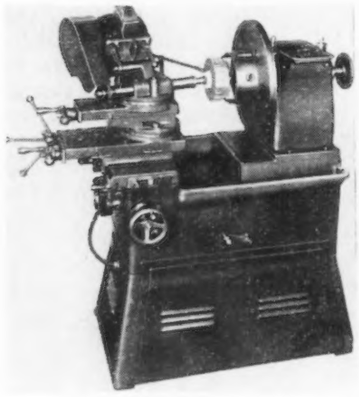
Grinder Headstock

A HEADSTOCK, said to incorporate noteworthy improvements, has been added to their line of hydraulic universal grinding machines, announced by *Cincinnati Grinders, Inc.*, Cincinnati 9. Of major interest is the adoption of a modified lathe standard spindle nose, which permits standard chucks and face plates to be mounted without intermediate adapters. The majority of live spindle work will be accomplished with a chuck or face plate mounted directly on the spindle nose. However, it may be desirable to remove the work and chuck as a unit for inspection. An operation of this type may be accomplished with the quick change adapter applied to the chuck. In

addition to the obvious advantage in convenience of adjustment for wear, a more rigid construction is claimed, with very little overhang from the front bearing to the spindle nose.

Multi-Purpose Grinder

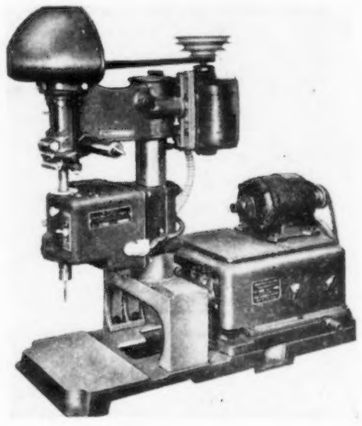
THE design of the Lempco model ACX Multi-Purpose Grinder, announced by *Lempco Products, Inc.*, 5500 Dunham Rd., Bedford, Ohio, has the wheel-head mounted on two different compounds, each graduated to 180°, thereby permitting even the most difficult of internal or external taper grinds or turns to be easily and accurately done. Another feature claimed for this grinder is that the workhead can now be moved 6 in. toward or away from work, by simply removing and replacing just four screws. By so doing, the swing can be increased from 18 to 30 in., which increases the number of jobs which this machine can



handle. It has both hand and power cross-feeds, a work length capacity up to 8 in., and two reversible spindle speeds of 80 and 130 rpm. A retractible tool holder bar is said to enable finished grinding to follow turning operations without removing the cutter.

Operating Fixture

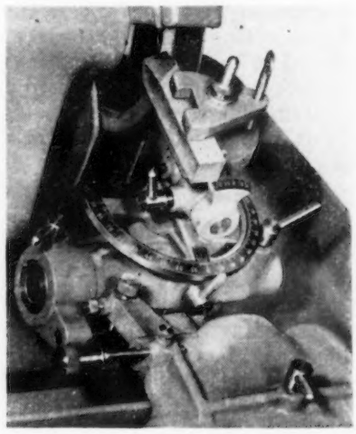
THE Pond operator, a war-proven development only recently available to the trade, has been announced by the *Pond Engineering Co.*, Springfield, Mass. It is designed for the rapid and inexpensive conversion of hand controlled machine tools to automatic operation. Its function is most simply expressed as that of eliminating the manual element in feeding, locating, clamping, advancement of work to tool and removal of finished work, making possible the assignment to two to six machines per attendant, depending upon the type and size of magazine, hopper, bar or other feed concerned. More recent applications of this machine have included much success in the plastics field on such precise secondary operations as drilling and tapping as well as the continued outstand-



ing production increases made possible through the course of the war and since by this machine in the various metal trades.

Carbide Tool Grinder

A CARBIDE tool grinder, embodying a reciprocating action principle that builds the grinding skill into the machine, has been announced by *E. F. Hager & Son*, 98-02 217th Lane, Queens Village 9, N. Y. This grinder is claimed to eliminate guesswork on angles and free-hand operation. Its built-in reciprocating action unit, consisting of a toolholder-protractor arrangement, pivots on a definite fixed center and cannot float. This constant control of the tool is said to assure exact angles ground to a

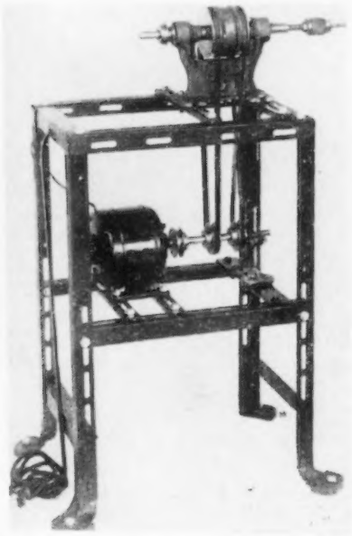


lapped finish, even with unskilled operators, and speeds up the grinding operation. This device grinds tools up to and including 1½-in. sq. Carbide tools for lathes, auto-

matic screw machines, milling cutters, offset tools, spiral reamers, counterbores and any other carbide-tipped tool within the range of the machine can be ground. A wide range of attachments are available for these and other types of carbide-tipped tools.

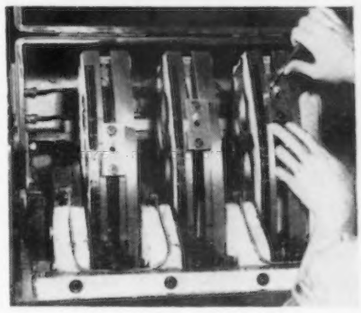
Horizontal Tapping Machine

THE Star friction drive tapper has been announced by *Samuel S. Gelber*, 32 S. Jefferson St., Chicago 6, and is said to be simple in design and operation. A slight pressure on the work and the back friction driving surface operates to start the tap into work. A slight pull on the work and the front friction drive surface revolves faster to instantly reverse the tap. The spindle runs in two high quality bronze bearings, and the stand is readily adjustable to keep belts tight.



Multiple Spindle Automatic

A MULTIPLE spindle automatic that cuts setup time to the minimum has been announced by *Warner & Swasey Co.*, Cleveland. Cams are said to be eliminated on this machine, and in their stead, permanent quadrant linkages provide infinite adjustment for quick and accurate setting of the turret and the five cross slides. Other features include harmonic bar feed, micrometer setting for each of the five cross slides, and easy access to all tool positions. Twenty-four spindle speeds are afforded by eight sets of pick-off gears and a high-low shift which is operated by a single lever. The chip conveyor is equipped with safety clutch, to avoid breakage should the conveyor become jammed. Two sizes of the machine are available, for 1¾ and 2¼-in. bar stock. The machine is provided with disconnecting mechanism for spindle drum indexing, for bar chucking, and for bar feed.



Roto-Matic Miller

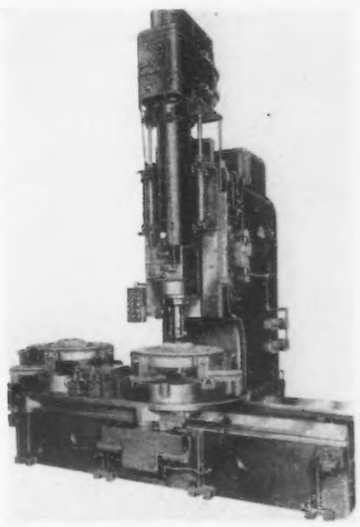
FOR the continuous milling of the parallel faces of transmission cases, the No. 2-B Roto-Matic miller has been announced by *Davis & Thompson Co.*, 6411 W. Burnham St., Milwaukee 14. Work pieces are automatically clamped and located. Rotation of the work drum passes work through the roughing cutters and through the finishing cutters successively, and after a rotation of the work drum, milling operations are completed. Fixture drum has 12 stations insuring a continuous flow of pieces through the cutters. Cutter heads are driven by a train of helical gears and a set of V belts from the main drive 20 hp motor. Oiling provisions consist of multiple lubrication of the sight feed type. This combination of features incorporating a wide range of overload factors, insures rigidity of construction with the result that close tolerances are maintained.

Lathe Bed Turret

A BED turret for lathes up to 14-in. swing has been announced by *Enco Mfg. Co.*, Chicago. Known as the Hexturret, it uses double steel drive gears and double racks for equalizing the feed of the tool on the work. All bearing surfaces are hand scraped, spotted and fitted to assure proper alignment and long, carefree use. All parts of the indexing mechanism are hardened. Extreme precision of indexing is claimed through the use of hardened and ground tapered bushings in the turret head, and hardened and ground tapered index pin and pin sleeve.

Automatic Boring Machine

A SPECIAL-purpose, automatic-cycle machine for rough and finish boring wheels for railroad cars has been announced by *Snyder Tool & Engineering Co.*, 3400 E. Lafayette Ave., Detroit 7. It is claimed to combine improved accuracy with increased production rate and is engineered to maintain its efficiency over an estimate lifetime of 20 yr. A 19-in. stroke is provided so that rough and finish boring may be performed in succession.



Spindle feeds are from 2 to 24 ipm and various spindle speeds are provided through the use of a four-speed selective transmission or a variable speed motor. Work is held by two 5-jawed chucks of 42-in. capacity, operated by individual hydraulic cylinders. Work-cycle is automatic, and capacity is 20 hp for a finishing machine and 30 hp for a roughing machine.

Automatic Piston Machine

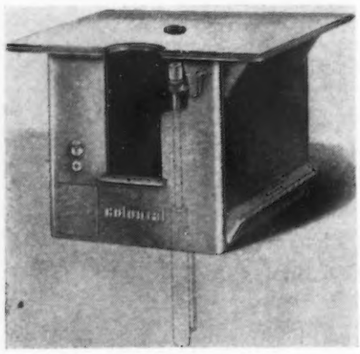
FOR performing one or several of the many operations involved in processing pistons. A "special" has been announced by *Snyder Tool & Engineering Co.*, 3434 Lafayette Ave., Detroit 7. This particular machine is a two-spindle automatic for counterboring, facing and centering aluminum alloy pistons and its design is such that it can readily be retooled for other pistons at relatively little cost. The machine is

said to be a double-station set-up; each spindle is independent of the other and can be loaded and started separately if necessary. There are two slides provided with cutting tools, one set for roughing and one set for finishing. Machine base and column are welded steel and the base houses spindle drive motors and clamping mechanism. The hydraulic power unit is mount-

ed to the left of the machine, and coolant tank and tray are at the right hand side.

Broaching Machines

COLONIAT flat-top utility pull-down broaching machines, have been announced by *Colonial Broach Co.*, Detroit 13. This machine according to Colonial is not intended for high production broaching, although automatic broach pullers are available. Primary purpose of the machine is said to be to fill the need for a utility machine for large work which will eliminate the necessity of special work holding fixtures. In this



machine, the broach is pulled through the work by a hydraulic-pull-mechanism operating on the same principle as in Colonial universal horizontal machines. To broach a part on this machine, the part is merely placed on the flat-top table and manually positioned. The broach is inserted in the hole to engage the broach puller. All operating mechanisms are concealed within the base.

Milling Machine

A PLANETARY milling machine designed especially for high-volume, low-cost thread milling and form milling, has been announced by the *Plan-O-Mill Corp.*, 1511 E. Eight Mile Rd., Hazel Park, Mich. Called Plan-O-Mill No. 1, it differs from previous planetary milling machines in size and unusual ease of operation. Completely anti-friction, it provides, according to the manufacturer, thread-milling accuracy with tapping speed. Furthermore, its makers

claim, it represents an advance in accuracy, troublefree operation and simplicity of setup, with added emphasis on economy. It incorporates such earlier Plan-O-Mill features as push-button operation, coordination of General Electric and pioneered on Plan-O-Mill, for split-thousandth control of feed-in and feed-around. The machine has facilities for either external or internal threading, and threads and mills parts up to 2 in. ID or OD, or larger with offset head. It is operated by means of an electronic control panel which may be mounted on the floor, wall or ceiling.

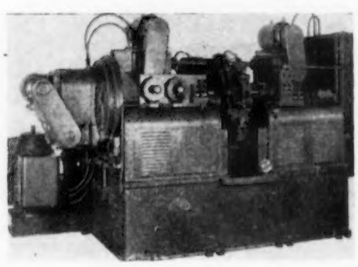
Precision Filing Machine

THE All American precision die filing machine which is claimed to insure complete accuracy in filing, honing and sawing, has been announced by *The All American Tool & Mfg. Co.*, 1014 W. Fullerton Ave., Chicago. This is said to be made possible by a patented universal joint file clamp which assures a 100 pct vertical file position despite warped or twisted file shanks. A file setting square is supplied for aligning the file or other tool before the universal joint is tightened. An overarm is provided to hold file against work, tilting table to hold work is 8¼ x 8¼ in. File is actuated by a scotch yoke mechanism running in an oil bath, and a window in housing

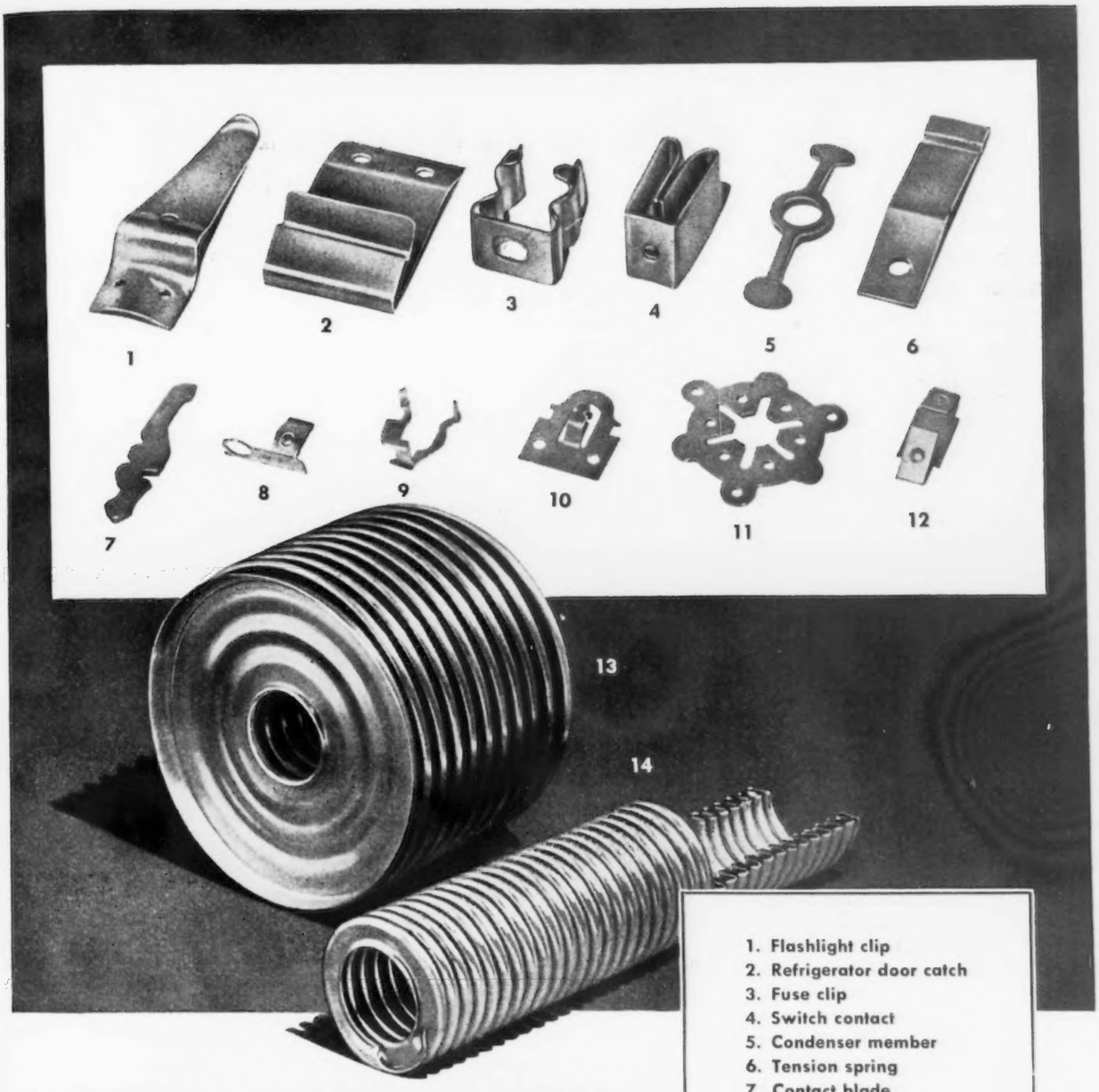
shows correct oil level at all times. Vertical shaft bearings are adjusted by locking thumb screws on the outside.

Special Purpose Valve Machine

A TWO-WAY Snyder special purpose machine has been announced by *Snyder Tool & Engineering Co.*, 3434 Lafayette Ave., Detroit 7, for boring, facing and tapping valve bodies of iron, bronze or aluminum in a wide variety of shapes and sizes. The part is held in a fixture on a four-station trunnion, and the side housings each contain two individual lead screws and quick-feed tool spindles with brackets sliding on hardened and ground ways. Tapping units are equipped with individual lead screws and quick-change pick-off gears for tool speed change. Control equipment is set



up for manual or automatic operation, control buttons being provided for setting up each individual tool spindle independently. Work cycle is loading and clamping, indexing to the next station where all work spindles come in, automatically performing various operations from both sides.



1. Flashlight clip
2. Refrigerator door catch
3. Fuse clip
4. Switch contact
5. Condenser member
6. Tension spring
7. Contact blade
8. Sliding contact
9. Guide fork spring
10. Switch tension spring
11. Spring pressure plate
12. 3-way plug contact
13. Tin-coated bellows
14. Flexible hose

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In many cases it is the ability of Phosphor Bronze to resist repeated reversal of stress that is its most valuable property. Hence its wide employment for springs, diaphragms, bellows and similar parts. In addition its corrosion resistance in combination with high tensile properties render it invaluable in chemical, sewage disposal, refrigeration, mining and similar applications. In the form of welding rod, Phosphor Bronze has many advantages in the welding of copper, brass, steel, iron and the repair of worn or broken machine parts. Revere suggests you investigate the advantages of Revere Phosphor Bronzes in your plant or product.

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Assembly Line . . .

STANLEY H. BRAMS

• Short steel supply looming up as biggest barrier blocking way to mass auto output, but strikes in parts plants also are playing a part in the current mild operating rates.

DETROIT—If you are one of the large army which would like to get quick delivery on a new automobile, there is a very simple way to do it. Simply walk into any automobile company, the one of your choice, and tell them where to get some steel, preferably some sheet steel—a ton or so, enough to build an automobile, should certainly be enough to assure you of preemptive delivery, your own choice of model, and no questions asked.

During the past week the second and third largest producers in the industry have both proclaimed publicly their worries about steel. Chrysler's K. T. Keller told stockholders last week that, "our plants could now produce at a much higher rate if we could get a flow of material and parts steady and adequate enough to sustain production. Our biggest problem at present is to get sufficient steel."

Ford late last week announced that it was compelled once again to suspend production operations in virtually all of its plants due to shortages of steel and component parts. Company officials described the steel shortage as the most serious obstacle in the path of full scale production, declaring that cold rolled for passenger car and truck bodies is unavailable in the quantity necessary and that other shortages "run a gamut from motor blocks to nails."

General Motors, biggest of the big three, is not without its problems either, despite the opportunity it had to build up stocks of material and components during its four months' strike. Although G.M. inventories were amplified during that period to a point close to the maximum stockpile levels permitted by the Civilian Production Administration, the inventories were not at all balanced. Fisher Body division had long lists of steel wants late in the strike, and the particular shapes sought were at that time in very low supply. Bottlenecks accruing from thin stockpiles will in all likelihood plague the car and truck producing divisions of General Motors in the near future unless the coal strike is settled and steel output and shipments return once more toward normal.

STEEL, quite obviously, is far from being the only problem of the automobile makers, but it is a good whipping boy at this time. Strikes in supplier plants bloomed out during the past few weeks, following the end of the General Motors strike and the completion of concentration on that one objective. Ford listed no less than 36 parts supplier plants now out on strike, and as a result shut down its Lincoln operations on car production for an indefinite period last midweek. Lack of crankshafts and cylinder blocks caused by strikes in the plants of two suppliers forced the shutdown.

At South Bend, Ind., Studebaker's hopes of getting an early start on 1947 model production sometime this month have also been impaired by the supplier strikes. The walkout at the Midland Steel Products Co. plant in Cleveland shut off the supply of frames to Studebaker, and is delaying the start of new model production at this plant. The same strike has halted production at Hudson, in Detroit.

As a result of these difficulties in the way of production, output will probably remain on somewhat of a plateau for a few weeks ahead. Then, if the coal strike has not yet been settled, it will begin to taper downward as the companies reach toward the bottoms of their steel and parts stockpiles. Last week, however, saw production rise to the best level it has attained since the end of the war—57,565 units, according to Ward's Reports, Inc. This compared with 49,425 in the preceding week, and with 20,335 trucks in the comparative week of 1945. The one thing which will sustain production in the weeks ahead is in the General Motors plants, which are just beginning to

THESE NEW CARS WENT TO MEXICO: *New cars, still a scarcity in United States, are a daily shipment to Mexico. This picture shows Hudson cars being checked over by U. S. Customs officials before crossing the International bridge at Laredo, Texas.*

NEW FEATURES MAKE IT

an even better investment

You can now obtain Pratt & Whitney Air-O-Limit Comparators with the new solid tungsten-carbide gaging plugs. With increasing manufacturing costs and fixed ceiling prices, these super-hard, long wearing plugs will lower your cost per gaging operation, maintain their specified accuracy longer, and speed up your production.

With their meter scales calibrated to split "tenths," Air-O-Limits give an instant precision check on I.D., O.D., taper, roundness, length, and bellmouth. Contained in a compact, modern designed stand, with no moving parts except the meter, they need only to be connected to your air supply.

There are several models and various sizes and styles of T-C and chromium plated gaging plugs according to your work requirements. Our gage engineers are ready to assist you in planning and working out your gaging problems.

Write for more detailed information about Air-O-Limit Comparators to your nearest Pratt & Whitney Branch Office or to the address below.

The illustration shows an inspector using our Model D Air-O-Limit Bench Type Comparator with a hand gaging attachment and hose extension to check blind holes in both ends of motor brackets. Note the calibrated dial with the high and low limit pointers.

PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD 1, CONNECTICUT

get going and whose output, even in the face of bottlenecks which are likely to slow them down, will at any level of quantity represent a gain over past recent performances. Illustrative is the swing back to production at Buick, where final assembly operations began Apr. 8 and have been expanding almost daily. More than 12,000 manufacturing employees are now back on the payroll. Production at this plant is currently limited to the 4-door series 50 sedan, and other models will go into assembly as volume is accelerated.

DODGE, meanwhile, has formed a conservation unit in its pressed steel department which is estimated to be saving 300 tons a week. Of interest is the fact that under this program Dodge is not selling any steel scrap, but is melting it down and using it for castings right within the plant.

As sheet steel from the mill is unrolled and cut into fender blanks, large segments of flat scrap are first cut away. New dies are said to have been developed by Dodge tool engineers to make maximum use of these irregular shaped segments. Flat scrap segments too small to use by themselves are stitched together in a spot welder and then pressed into such parts as seat end frames, engine dust pans and fender guards.

After the deep drawing of fenders, the shaped edges of steel trimmed from the fender blanks are rolled flat and reformed into such structural car parts as seat edge frames and seat back frames.

The scrap remaining after all stamping operations is conveyed to the Dodge foundry, put into the cupolas, remelted and poured into engine blocks and other castings.

In this era of contradictions the plodding automobile industry is beset with a scarcity of technical employees and with a near-scarcity of shop labor. The United States Employment Service estimates that about 100,000 workers may still be unemployed in May in the Detroit area, but that they will largely be women and male employees who fail to meet most employers standards for specific job openings. In the meantime lack of local housing makes outside recruitment impossible. It should be noted that many companies found inexplicable small shrinkages in their working forces when the General Motors strike ended; apparently many of the strikers very quietly went elsewhere and got strike-duration jobs. This was not too hard to do because a surprising number of the local plants have run all through their seniority lists and are hiring today off the street.

In the front offices the supply shortage list made up by the USES includes engineers, designers, draftsmen, machinists, tool and die makers, sheet metal workers, molders body builders and metal finishers. Architects also are scarce. Display advertising for most of these types of jobs is a commonplace in the Detroit papers every day.

New Ford Official

Detroit

• • • **Albert J. Browning, who as a brigadier general was in charge of purchasing for the War Dept. until the first of this year, has been named director of purchases for the Ford Motor Co. He succeeds Charles H. Carroll, who has been named assistant general manager of the new Low-Priced Car Div. Before the war Mr. Browning was a group merchandising manager for Montgomery, Ward & Co., in charge of automotive accessories, tires, hardware and other heavy line items. He went to Washington as co-director of purchases for the Advisory Commission to the Council of National Defense. Since January he has been organizing the newly-created Office of Domestic Commerce in the Dept. of Commerce.**

New Auto Output Set

Washington

• • • **Almost doubling** the February output, March automobile production reached a postwar peak of 90,045 cars to bring total production since controls were removed July 1, 1945 to 280,277 units, CPA reports.

Adverse factors held truck production to 39,459 vehicles, however, and while this was a gain of 10,667 over February output it fell far below forecasts. Work stoppages and insufficient supplies were major factors in delaying production, CPA commented, and until these problems are solved the agency declines to offer forecasts of future production.

Performance of individual manufacturers ran from one extreme to the other, the report showed. One automobile manufacturer produced nearly as many cars during the month of March as it had assembled during the previous eight months; on the other hand, six firms, including newcomers, were unable to report any production.

Cumulative effects of the coal strike plus the fact that a major supplier of auto frames continues strike-bound offers a gloomy outlook for the month of April, officials said.

New Pricing Procedure

Washington

• • • **Effective** as of Apr. 22, manufacturers of cast iron boilers may use the same procedures as manufacturers of mechanical building equipment to obtain individual price adjustments, OPA announces. Applications may be filed with Building & Construction Price Div., Prefabrication & Building Branch, Washington, D. C.

ANOTHER HOME-MADE CAR: *That skilled mechanics have not been idle during the war years is attested by the accompanying photograph of a home-made car built by Bunny Ronco, Chief Inspector of the Allentown Plant of Mack Mfg. Corp. Wheelbase is 96 in. and the vehicle weighs 1350 lb. The wheels are 5.50 x 16, independently sprung front and rear. Estimated maximum speed is 67 mph.*

The Way To Lower Unit Costs On Your Alloy Steel Parts

----------FOR LOWER COSTS ALL ALONG THE LINE----------

Saving time in production is the way to cut unit costs. The operations shown here are a few examples of spots where some manufacturers have cut costs by finding a Carpenter Special Purpose Alloy Steel to *fit the job.*

And on *your* jobs, you will also be interested in an alloy steel to—

- Meet unusual toughness and wear requirements
- Pass magnetic particle inspection
- Provide extra safety in resistance to fatigue
- Give you improved machinability
- Have a high finish after machining
- Resist heat effectively
- Respond uniformly to heat treatment
- Have a combination of good toughness and hardness, yet be soft enough to machine well

Carpenter Special Purpose Alloy Steels are made to tool steel standards. And that is important to you, because Carpenter furnishes the alloy steel you need . . . with a finish, or heat treatment, or close tolerance that often *eliminates an operation* on the steel in your plant.

Let us take a look at the blueprint on some alloy steel part where you have had trouble from the standpoint of production or performance. And for further information on the cost-saving possibilities with Carpenter Special Purpose Alloy Steels, ask for "Fitting the Steel to the Job." This 16-page booklet is yours for the asking.

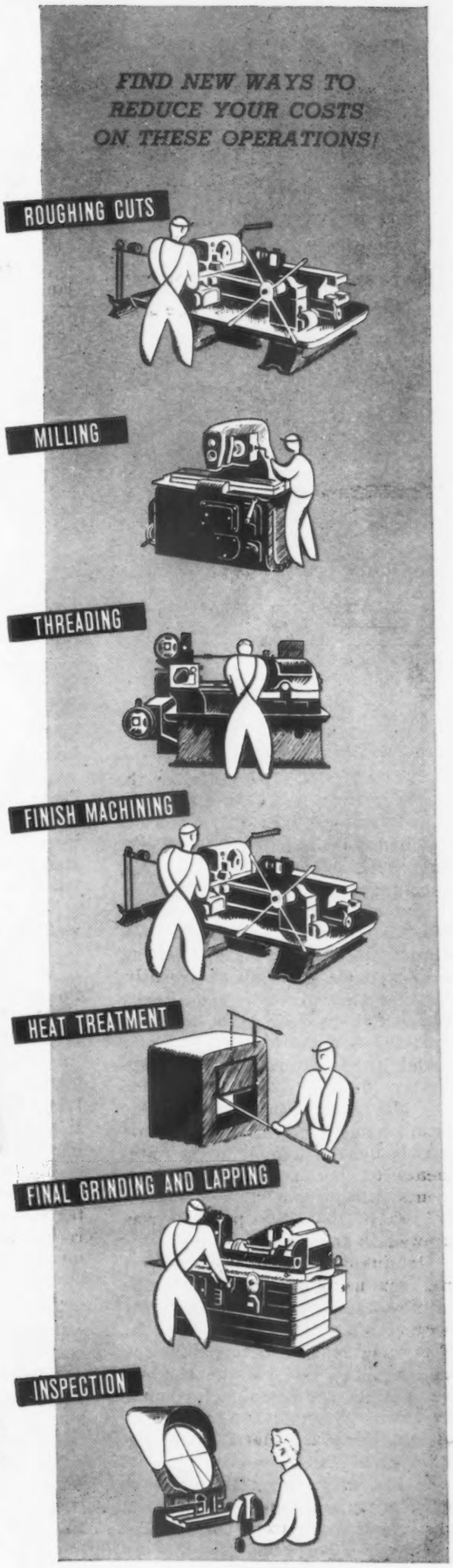
Carpenter

SPECIAL PURPOSE

ALLOY STEELS

. . . made in a tool steel mill
. . . inspected by tool steel standards

THE CARPENTER STEEL COMPANY • 121 W. BERN STREET, READING, PA.



Washington . . . .

L. W. MOFFETT

• Majority FTC decision in beer label case eases up on business . . . Said to reflect White House view . . . Commissioner Mason berates meddling.

WASHINGTON — Unlike the courts, it is seldom that the Federal Trade Commission is divided in its opinions. Usually, and over long periods, they are monotonously unanimous.

But a rereshing break from the routine which appropriately concerned the stimulating subjects of beer and ale came about recently. Getting away from its customarily picayunish pecking at business, it modified a cease and desist order which graciously permits the Manhattan Brewing Co., Chicago, to use the word "Canadian" in the brand name for beer or ale. This may be done if accompanying statements on labels or in advertisements "conspicuously and adequately" show that the product was brewed in the United States.

Originally the company was barred from using any trade name containing the word "Canadian" for beer or ale not brewed in Canada. For some reason, perhaps it was an oversight, the Chicago concern was not cracked down on for using the word "Manhattan," which is so familiarly associated with another great American city.

In loosening up on the original order, a majority opinion, given in the layman's language and reflecting common sense and fair play as well as cutting jibes at the narrow inhibition imposed in the first order, was written by Commissioner Lowell B. Mason who was supported by Commissioners Garland S. Ferguson and Robert E. Freer. Mr. Mason did not state their views in such terms but in effect they shared the idea that it is the taste and quality that counts and there was no complaint on that score. The minority, Chairman William A. Ayers and Commissioner Ewin L. Davis, held tight for cheese paring. In a dissenting opinion they cried out against change of the order lest its purity be contaminated.

The split in the Commission was given outstanding significance not merely because of precedents it set, its rarity or because FTC opinions are seldom handed down, or even because of the peppery verbiage of Commissioner Mason. Rather the opinion excited its greatest interest because it is reported to have had White House inspiration. President Truman is said to have become fed up, just as business itself long has been, with the Commission's petty practice of hacking at business.

The President is represented as wanting to have FTC restored to a better standing with business and to become in reality rather than in theory the "Businessman's Court" as Mr. Mason called it. Hence, it is said that Commissioner Mason, a Republican and former Chicago lawyer, one-time associate of the late Clarence Darrow and close friend of the President, was sounding a White House view in calling a halt to the Commission's traditional tendency "to follow the letter of law' 'in disregard of sound reason and, to borrow Mr. Mason's piquant phrase, its "puritanical meddling and busy-bodiness."

So the shot fired by Mr. Mason was not simply directed at a "beer bottle label" case as he called it. It was interpreted as a notification to business generally that the Commission, or at least a majority of the Commission, was hereafter going to give up its hair shirting activities and assume a more constructive role toward business. Business is hoping that this is a correct interpretation but may have its fingers crossed until further evidence is afforded to support the hope.

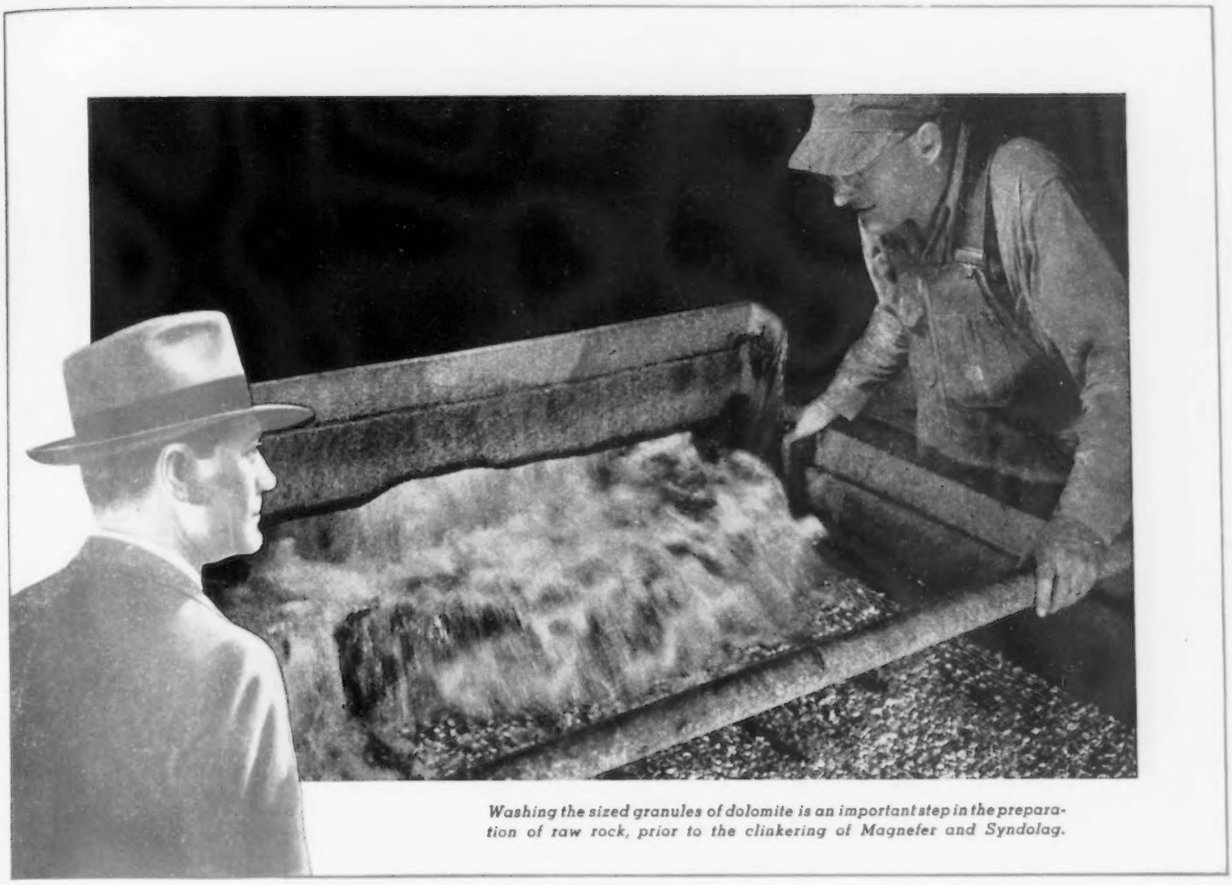
Examining the powers given the FTC by Congress, Mr. Mason points to the length to which they can be stretched by torturing the language of the law. In the case of the "beer bottle label" (a label that had been approved by the Alcohol Tax Unit) he refers to ads that deceive someone and ads that tend to deceive someone, explaining that Congress passed a law which the courts say gives the Commission the right to stop an advertisement that has the "tendency" to mislead. The Commission originally had literally followed the letter of the law, relying on its power under a straight-laced construction of the term "tendency" to mislead, even though the brewery declared that "nobody ever has been fooled."

To explain the difference between ads that deceive and ads that tend to deceive, Mr. Mason cited a hypothetical example of domestic infelicity:

"Few wives give their husbands black eyes, but many upon odd occasions may 'tend' in that direction," Mr. Mason observed. "The Police Dept. doesn't arrest many women for blacking their husbands' eyes, but if the police were required under the law to use no discretion but arrest every woman who had that tendency or that capacity, we would close down the shops, cripple manufacturing and almost completely destroy family life. So here: Just how far shall the FTC go in searching out and preventing false 'tendencies' and 'capacities' in advertising?"

There are so many advertisements in this world, Mr. Mason pointed out, and each "has the capacity and tendency" to do different things to different people.

To illustrate the varied reactions to such advertisements, the Commissioner said that if he were a competitor and saw a bottle of beer with the label "Canadian Ace" (Manhattan Brewing Co. label) he might "tend" to write FTC complaining that the label was fraudulent; that if he were a thirsty tramp he might have the "tendency" to beg, borrow or steal the bottle; and that if he were a tee-



Washing the sized granules of dolomite is an important step in the preparation of raw rock, prior to the clinkering of Magnefer and Syndolag.

CLEAN REFRACTORY•• CLEAN BOTTOM •• CLEAN STEEL

ONE reason so many furnace operators prefer Magnefer and Syndolag is because they are uniform in quality—in chemical make-up, as well as in sizing. They are "clean" refractories. This makes it easier to maintain a clean bottom with Magnefer or Syndolag, and that, in turn, results in cleaner steel.

Three important things contribute to the clean, high quality of Magnefer and Syndolag. First, the dolomite from which they are made is better than 99% pure. Second, the clay overburden is carefully and thoroughly stripped from the dolomite ledge before rock is quarried. Third, the prepared, sized dolomite is washed before burning, to remove any possible remaining impurities. Then, in the clinkering process, suitable bonding agents are introduced to give those characteristics which furnace operators recognize as ideal in a fettling refractory.

The Basic Sales Engineer who calls on you may be able to give you suggestions for using Magnefer or Syndolag most economically, and to improve your fettling practice. He is a practical steel man. His intimate knowledge of refractories, backed by actual experience in making steel, may enable him to help reduce your refractory cost per ton of steel. Don't hesitate to think of him as *Your* Refractory Engineer.

BASIC FURNACE REFRACTORIES

BASIC REFRACTORIES, INCORPORATED

845 HANNA BUILDING
Cleveland 15, Ohio

Exclusive Agents in Canada: **REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal**

totaler he would say the label "tended" to make him disgusted.

And so on down the roll call of humanity, Mr. Mason added, each person feeling different—some joyful—some mad—and some indifferent. Congress, he declared, had given the Commission the power out of all of this welter of emotions to seek out and stop all advertising that has the tendency and capacity to deceive.

"We are no moral Gargantuas, and consequently this feast of authority has at times been bad for the Commission's digestion," said Mr. Mason. "With the leavening of moderation lacking, we might stuff ourselves on the indigestible parsing, phrasing and syntax of too much advertising language while many vital questions of fair dealing in business remain untasted on the table."

An unbridled, intemperate wielding of this power to prohibit the use of words makes us grasp at much while we secure little, the majority opinion explained. The "beer bottle label" was cited as a good example. The order heretofore banned the words "Canadian Ace," it was pointed out, regardless of how they were explained or qualified.

"In my opinion," said Commissioner Mason, "this type of authoritarian decree is not just."

It is obvious, he declared, that this case is important to all businessmen, not just to beer labelers. Businessmen were told that they were concerned with the judgments of a quasijudicial body whose decisions, proclaimed to be in the public interest, may next fall on their heads.

"All restraints, whether warranted or unwarranted, are taken by government in the name of protecting the public," Mr. Mason continued. "The line between actual protection of the people and just plain 'busybodiness' has generally been made plain to the courts by examining the impact of an injury to the public welfare, such as an injury to competition or the fraud upon a customer. These things can be seen as it were with the naked eye, but since the Federal Trade Commission has been endowed by Congress with the power to protect the public from things which have the 'capacity' and 'tendency' to injure, the line between beneficial restraints and puritanical meddling has become hazy."

THE BULL OF THE WOODS — BY J. R. WILLIAMS

A RARE OLD CHIPPENDALE! WHY, THAT'S NUTTIN' BUT A OL' WRECK OF A DESK TH' BULL O' TH' WOODS USTER USE WHEN THIS SHOP WUZ STARTED!
SH-SH! I'LL GET THAT FOR A SONG, IF YOU'LL KEEP QUIET!
HERE'S WHERE A FORTY-MILLION DOLLAR OUTFIT GITS SKINNED!
COLLECTORS ARE CARDS -- IF YOU'RE IGNORANT, THEY SKIN YOU OUT OF IT--AN' IF YOU'RE EDUCATED THEY SKIN YOU WITH IT!
4-26
J.R.WILLIAMS
THE FIND
COPR. 1946 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

CPA Asks Voluntary Rationing for Copper

Washington

• • • **Because production** has been severely affected by effects of work stoppages, CPA has requested copper producers and fabricators as well as copper and brass warehouses to institute voluntary rationing of their product until the situation eases.

Mine and smelter production have dropped more than 50 pct while brass mill production has been reduced to 15 pct of capacity, the agency said. Copper wire mills are at 25 pct of capacity while copper rod mills are down to 40 pct.

In making the policy statement, Frank H. Hayes, director of the CPA Metals & Minerals Division, requested the adoption of the same rationing principles that were used by steel warehouses during the steel strike.

The government stockpile, which stood at 450,000 tons at the end of March, has been subjected to heavy withdrawals of certain copper shapes and now includes an undue proportion of fire-refined copper and an insufficient supply of the electrolytic type much in industrial demand.

Specifically, producers and fabricators of copper are requested to ration deliveries to amounts needed for immediate use only; to schedule shipments to assure supply of items for maintenance and repair; and to schedule shipments to non-integrated producers to assure proportionate amounts to each.

Brass mill and wire mill warehouses, having intimate knowledge of customers' needs, are requested to ration deliveries so that each receives no more than needed for immediate use; in instances where stocks are seriously depleted, make deliveries only for emergency maintenance and repair uses which have to do with public health and safety.

Elected to AISC Board

New York

• • • **At a meeting** of the board of directors of the American Institute of Steel Construction held Apr. 11, Clyde MacCornack, vice-president of the Phoenix Bridge Co., Phoenixville, Pa., was elected a new director to succeed Karl E. Vogel of the Omaha Steel Works, Omaha, Neb., who resigned.

"Measuring at the Machine"

MINIMIZES PRODUCTION LOSSES!

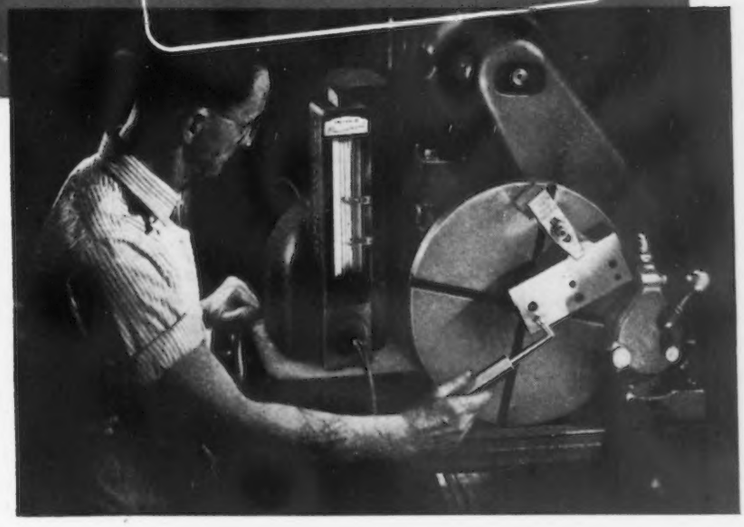
Reducing production LOSSES means reducing production COSTS. LOSSES usually occur at the machine—stopping such losses brings down costs.

"Measuring at the Machine" brings the following advantages which contribute to being able to sell a product profitably at or under competitive prices:

1. When accurate gaging is practiced right at the production machine, scrap losses have been reduced as much as 80% and 90%.
2. "Measuring at the machine" practically eliminates salvage work which is nearly always costly.
3. Component parts reaching the assembly line fit quickly and easily—no assembly time lost. Instead of working to the high limit as an operator normally does, he works to hit the part "on the nose."
4. When high production gaging instruments like the Multichek, Precisionaire and Visual Gage are used at the machine, the floor space devoted to inspection operations, gage maintenance costs and the labor cost of inspection are all greatly reduced.
5. Under close dimensional control, finished products give maximum performance, greater service life, and help build prestige for the manufacturer.
6. Fewer parts will wear out in service, and then replacement is quickly and easily done —no laborious fitting in the field will be necessary.

chek with Sheffield on "Measuring at the Machine"

1787



SHEFFIELD MASTER CRAFTSMEN

THE SHEFFIELD CORPORATION

Dayton 1, Ohio, U. S. A.

MACHINE TOOLS...GAGES
MEASURING INSTRUMENTS
CONTRACT SERVICES

West Coast . . .

ROBERT T. REINHARDT

• Impending opening of bids for Geneva steel plant holds attention of western industrialists . . . San Francisco labor situation relatively quiet, but strikes threatened.

SALT LAKE CITY—Some of the eager expectancy of the small boy on the day before the circus is to open pervades business circles of the West as May 1 approaches. The opening of bids for the Geneva steel plant on that day will have a heavy impact on the future of western industrialization and practically every man, woman and child in this section of the country is taking a personal interest in the event.

How many bids are in? Who will get the plant? How much will be paid for the mammoth steel producer? These questions are being kicked around wherever two or more businessmen meet. Best guesses seem to indicate that U. S. Steel Corp., Colorado Fuel & Iron Co. and Republic Steel Corp. have entered bids.

The charge made by Wendell Berge, Assistant U. S. Attorney General, that eastern steel manufacturers will seek to block operations of Geneva, by applying pressure on railroads for maintenance of high freight rates, aroused some concern for a time. However, the apprehension was directed at the attitude of the Dept. of Justice more than at the railroads or steel companies.

State officials and businessmen who have been most active in smoothing the path of prospective bidders are apparently convinced that the anti-monopoly attitude of the Dept. of Justice was the principal reason for the assumed withdrawal of U. S. Steel as a bidder. With the corporation reportedly again back in the running, these men are concerned lest the Department again revive the issue.

Local interests seem rather well satisfied with the off-the-record attitude of the railroads and are apparently confident that competitive rates will be established when the plant is in the hands of a private operator. One reason for this opinion is the contention that the future profitable operation of Geneva might well mean the difference between solvency and insolvency for some of the railroads which would get the freight. The favorable rates which have been in effect for a number of years on pig iron and cast iron pipe are cited as examples of the railroads attitude. The recent application for an increase of 25 pct in freight rates, made by the railroads to the Interstate Commerce Commission, is being watched with interest because of its possible effect in raising all rail rates to the point where water transportation of steel from the East would have even a greater advantage than at present. However, as has been reported here, studies are now well along toward seeking to establish increases in water rates for coastal and intercoastal shipping and if these are granted, rates between the two types of carriers should again be in competitive balance.

Regional differences throughout the West have all been shelved—temporarily at least—and there is a unanimous hope among industrialists in the 11 Western States that Geneva will operate. Utah businessmen see in this plant the nucleus of local industrialization and in other states it is the great white hope for a dependable source of steel—possibly at lower cost than has heretofore prevailed.

THE Steel Committee of the Western States Council headed by K. T. Norris, president of Norris Stamping & Mfg. Co. of Los Angeles, has rallied this support and maintained a persistent campaign for the continued operation of Geneva. Part of a recent letter sent out by Mr. Norris sums up the views of the council:

"For over a year the Steel Committee of the Western States Council, with the help and cooperation of all of the people of the West, has been working towards one objective—the continued operation of the war-built western steel mills on a basis which will insure a more adequate supply of steel at prices approximating those paid by steel users in other sections of the country.

"Studies made by this committee and supported by those made by independent engineering firms for the RFC, have indicated that the cost of producing steel at these modern western mills should not be materially different than at other principal producing centers. This committee has insisted that in the disposition of Geneva or the adjustment of any government loans on Fontana, the operator must be committed to a policy of pricing the product of the mill on the basis of cost of production plus a fair profit in lieu of the past practices of using an eastern basing point price plus freight.

"The policy to be followed by the government in the disposition of the Geneva mill was laid down in a report of the Surplus Property Administrator to Congress on Oct. 8, 1945. One of the principal provisions of this report is that in addition to the bid price, consideration will be given to 'the proposed pricing policy of the bidder. The disposal agency will consider the prospects of lower steel prices to steel users as a primary test of effective independent competition under the act.'

"The guide for preparation of bids or proposals furnished to prospective bidders by the RFC together with supplemental information received from both W. Stuart Symington, Surplus Property Administrator, and Sam Husbands, Director of the RFC, require among other things, that the bidder must submit with his bid a statement as to pricing policy together with plans, if any, for the establishment of basing point prices.

"The people of the West will be

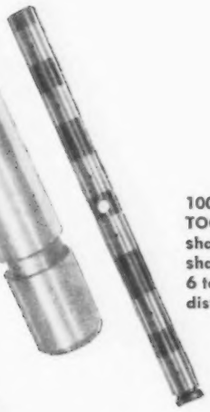
2500 PER HOUR

Valve stem ends TOCCO-hardened to depth of 3/32". Hardness of 50 Rockwell "C" accurately controlled.

300 AXLE SHAFT BEARING RACES PER HOUR. Hardens axle bearing to 62 Rockwell "C". Eliminates inner race formerly pressed on. Gives 50% more strength.

2000 PISTON PINS PER HOUR. Continuous hardening of carburized piston pins to 62 Rockwell "C". Pins TOCCO-hardened free of distortion and scale.

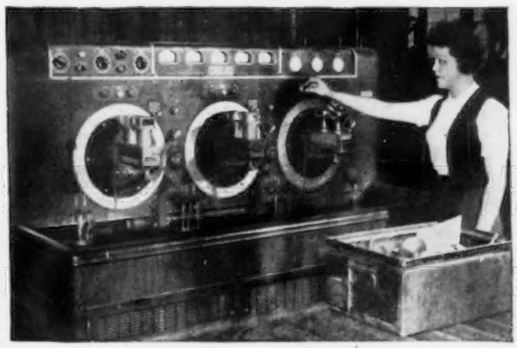
500 DISTRIBUTOR CAMS PER HOUR. Cam surfaces TOCCO-hardened to 62 Rockwell "C" after assembly eliminating copper plating.



100 ROCKER SHAFTS PER HOUR. TOCCO-hardened at six areas per shaft. TOCCO fixture accommodates shafts 14" to 36" in length, having 6 to 12 hardened areas. No scale or distortion.

FOR TODAY'S TEMPO:

Get this SPEED and VERSATILITY with a Standard TOCCO Unit



Speedy, accurate TOCCO Induction Hardening enables you to produce better products, faster, *at a fraction of the cost* of conventional heat-treating. One manufacturer gets such results for 142 different parts . . . with one standard TOCCO machine! Fixtures are readily changed, permitting quick tool-up to suit the job.

Find out how TOCCO's speed and versatility can help solve *your* problems and save *you* money. "Results with TOCCO" free for the asking.

THE OHIO CRANKSHAFT COMPANY • Cleveland 1, Ohio

TOCCO

INDUCTION

HARDENING, BRAZING

ANNEALING, HEATING

vitally interested in the bids received by the government for the disposal of Geneva. This committee proposes to be fully informed of the nature of these bids and to recommend acceptance of the government of that bid which offers the best chances of attainment of our objectives. Likewise, the committee expects to oppose the acceptance of any bid which will not accomplish our objective."

Secretary of Commerce Henry A. Wallace lost no friends in the West when at a press conference in Los Angeles last week he said:

"The Far West now has a better chance than ever before in its history to obtain steel at fair prices. This opportunity exists because the government, during the war, erected two modern steel plants to utilize western iron ore and western coal. These two plants—the Geneva steel plant, not far from Salt Lake City, Utah, and the Fontana Steel Plant of Henry Kaiser, just outside the great Los Angeles market—are capable of producing more than 2,000,000 tons of steel ingots a year. The government can hardly expect to recapture the full $300 million which these plants cost. They were constructed under terrific pressure and necessarily at high cost. If both these plants are valued by fair commercial standards, the cost of steel to western manufacturers will be reduced, because these great modern plants can convert western iron ore, coal and limestone into steel products as cheaply as the best eastern plants."

Seattle and San Francisco Chambers of Commerce have been supporting the work of the Western States Council although there are minor differences of opinion on the matter of attempting to exact pledges from potential Geneva operators as to the basis on which steel prices will be established.

SAN FRANCISCO—The 40th anniversary of the 1906 earthquake observed here last week found both the earth's crust and the labor upheavals of the past few months comparatively quiet.

Longshoremen continue to hold a strike threat over the heads of the Pacific Coast Waterfront Employers Assn. as a government fact-finding board investigates the situation, and the CIO Utility Workers threaten to go out this week against the Pacific Gas & Electric Co. Both of these strikes, if they become realities, will have serious effects on industrial production.

The longshoremen's strike would paralyze Coast shipping and a walkout of PG&E employees would stop all production of steel and other commodities in central California.

However, there is a considerable feeling of optimism among well-informed businessmen who believe both disputes will be settled by arbitration before actual walkouts occur.

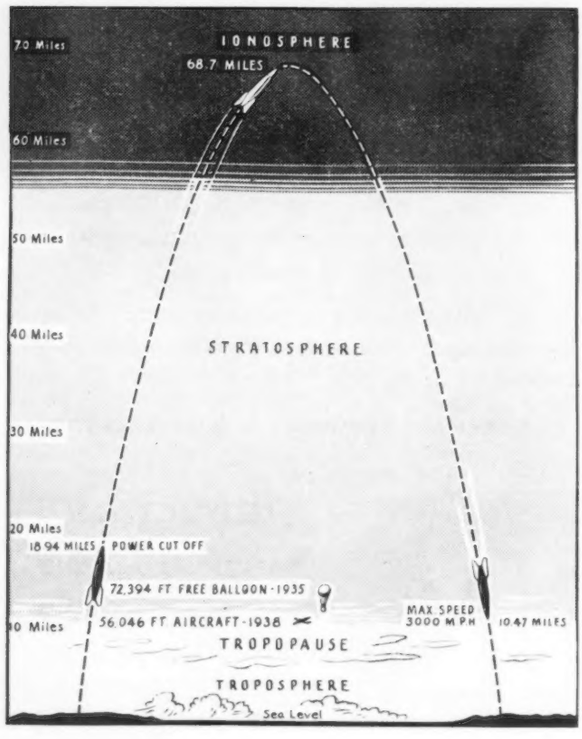
Considerable interest has been shown by the large operators of fishing fleets in this area in a new design, all-steel tuna boat launched last week on San Francisco Bay. Measuring 82 ft in length and with a 22-ft beam, the hull is welded throughout. Approximately 70 tons of steel plates from 3/8 in. to 3/16 in. are used in construction.

This craft is the first of four being built by the HEO Boat Co. of Oakland, Calif., for use by the Hoovden Canneries of Monterey, Calif. The designer and builder, H. E. Ottenbreit, claims many advantages for this all-steel ship over wooden vessels. He maintains that it is practically unsinkable with two special bouyancy tanks and that its carrying capacity is greater than a similar sized ship made of wood. It is stated it will carry 160 tons of tuna under refrigeration and that the ship can be maintained at sea indefinitely.

The antipathy of fishermen toward all-steel boats is slowly being overcome apparently as new designs are being produced. The Steel Boat Co. of Portland, Oregon, recently launched a 42-ft all-steel troller with a 20-ton hold capacity. This boat was built under the supervision of E. G. Lamberton, formerly a superintendent at Willamette Iron & Steel Co. shipbuilding plant.

Marin County businessmen are unhappy in that to date, Marinship on San Francisco Bay, which built tankers during the war, is not as yet up for disposal. This shipyard is considered a likely site for industrial plants seeking locations in this area, according to businessmen who are petitioning the U. S. Maritime Commission to release the yard immediately.

Pacific States Steel Corp. at Niles, Calif., is beginning its postwar expansion program it was announced by Joseph Eastwood, Jr., president. Five electric furnaces are now producing 90,000 tons of steel per year which goes into forging ingots, bars, angles, flats and rounds. The expansion program includes a 22 in. breakdown mill.



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BUCK ROGERS TAKES A TRIP: *The diagram traces the estimated flight path the German V-2 rocket is expected to follow when it is launched early in May in a test conducted by Army Ordnance Dept. at White Sands, N. Mex. The diagram was prepared by General Electric engineers who will participate in the tests.*

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10 to 1

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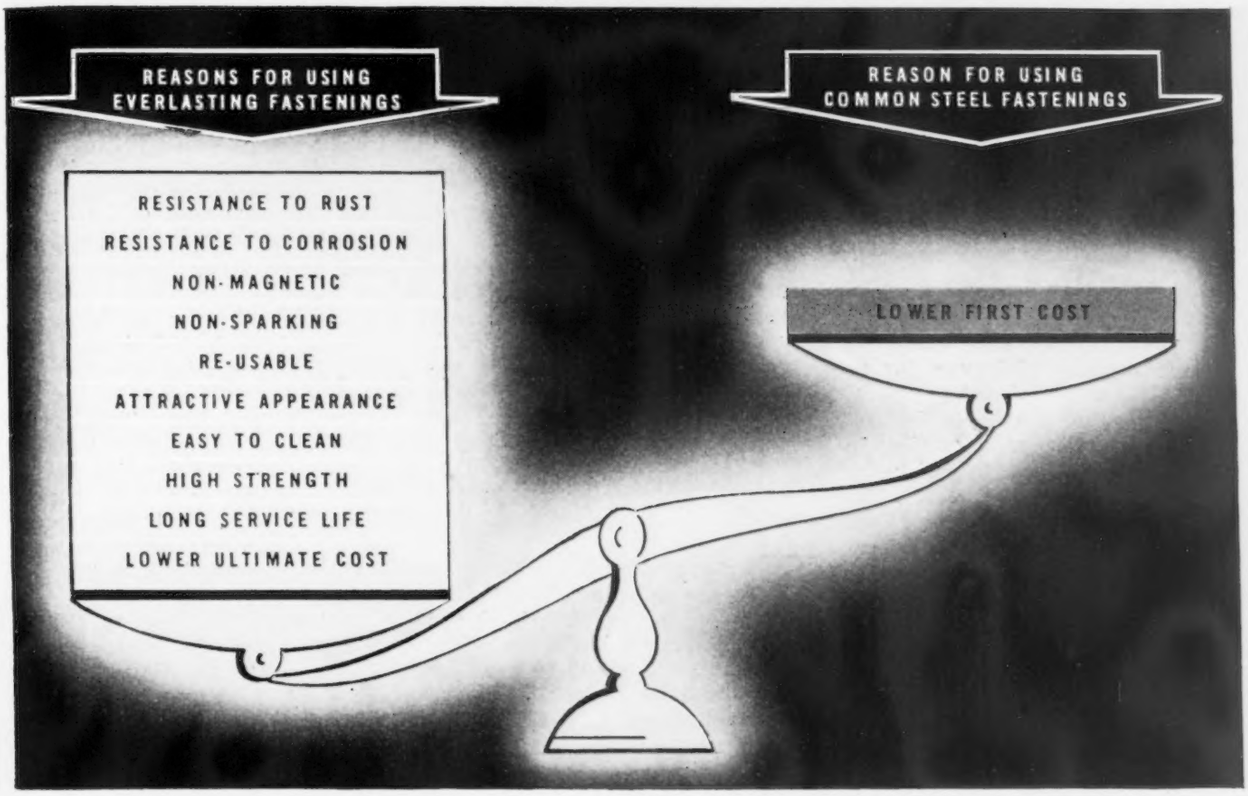

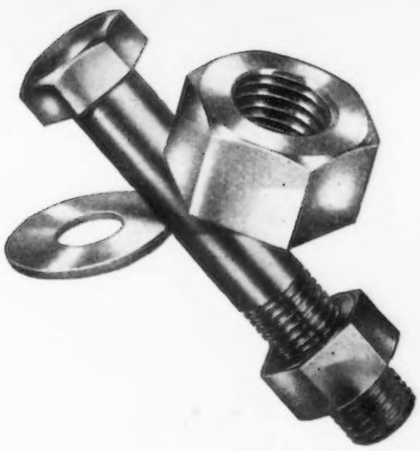

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European Letter . . . JACK R. HIGHT

• Churchill takes lead in opposing nationalization of the British steel industry . . . Claims pure politics in heated debate.

LONDON—My first House of Commons visit was for no less an occasion than the announcement of the Labor Government's intention at some time in the indefinite future to nationalize the British steel industry. The scene was one of expectancy, the House was crowded. I had some difficulty in hearing, as the press arrangements in the temporary seat of Commons are a little crowded.

The session opens each day with a formal "question session," with the various ministers and their representatives answering questions put by the members. The questions ranged from the colonial policy on Malaya to the quantity of overripe oranges imported last year.

Question time ended as abruptly as it had begun, and at 3:23 p.m. (23 min. behind schedule), the Minister of Supply, Mr. John Wilmot, was on his feet reading the fateful statement. The reaction to the brief announcement by the minister was immediate. Mr. Churchill was on his feet with notes in hand, heavy glasses pulled down on his nose to utter the first blast against the proposal:

"I think the House must have been astonished at the statement to which we have just listened. First it is quite clear that the government has no plan of its own. During the next year or two, so far as I can gather from the statement which has been vouchsafed, they are going to seek reasons to justify the decision which they have now taken."

At this point the speaker of the House interrupted the war leader to suggest that the statement was in the nature of starting a debate, a procedure which would be out of order under House rules. From this point for the remainder of over an hour the House saw the spectacle of two debates going on simultaneously, one over the future of the iron and steel industry, and another of parliamentary procedure as to whether the proceedings were in order.

The opposition, led by Mr. Churchill, bitterly attacked the Prime Minister for bringing forth the announcement of such a vital matter without allocating "the proper time for debate." The government reiterated its position in reply that the nationalization was a part of the mandate under which it was elected, and that there had been opportunities to debate the issue in the past and would be again when the legislation was presented.

THE opposition took a dim view of the fact that the administration of the new interim board was to be set up in the meantime, and that much would be done before formal debate took place. The argument became so heated at one point that the Prime Minister was halted while answering a question by a shout of "Hitler" from one of the members.

The hasty ejaculation was withdrawn by the offending member, who apologized, "I withdraw the word, of course, but you have to admit that the tactics are the same." The London press described the scene as the most heated in the current term of Parliament.

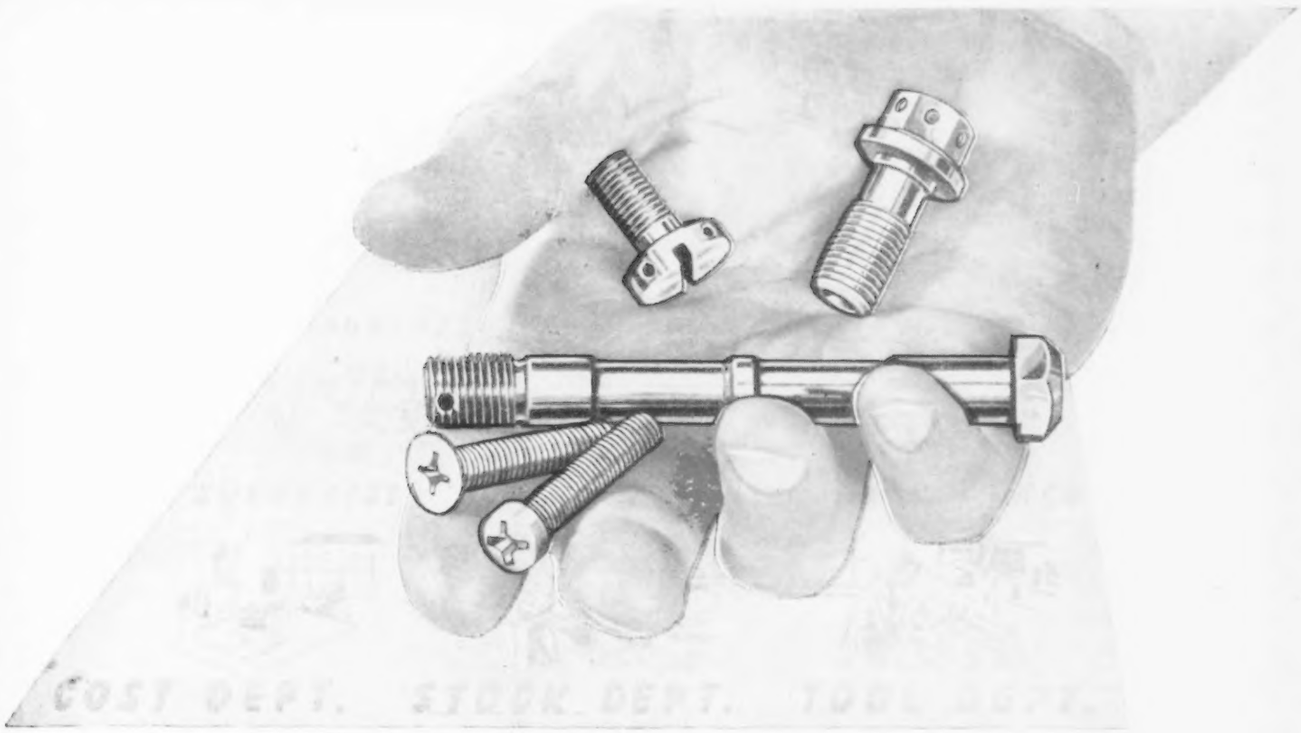
Considerable discussion also centered around the absence of the much discussed British Iron & Steel Federation report, which the government studied before coming to the decision to nationalize the industry. The same demand has been pressed previous to the outbreak in the House by many sources. The reply of Mr. Wilmot to the demands for the report was that he would have to consult the authors before he could publish it, and after sharp exchanges with two members who tried to force the publication by parliamentary means, the Prime Minister agreed that he would ask for the permission of the authors.

In a later session with reporters Mr. Wilmot stated that he could think of no objection that he had to the publication of the report, if the Federation had none, so it seems likely that the report will find its way to light in the near future.

A bitter attack on the Federation was made by Member S. N. Evans, who also mentioned the possible use of Americans in the nationalization program:

"Having regard to the fact that the British Iron & Steel Federation has consistently put the interests of its members before the interests of

DOES ANYBODY WANT A DIESEL?: *Lying unguarded in the east end of London and nearby are dumps of Cummings diesel-electric generating sets, each generator being worth about £1500. They stand on bombed sites without even a wire fence around them and are being used as playthings for local children.*



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Suppose you concentrate this talent — this investment in skill and experience — on those operations that *must* be done in your plant. . . . There are endless possibilities in this idea!

2. "CORBIN SCREW" specializes in the designing, manufacturing and accurate finishing of "Production Parts" to meet your requirements. We have M³ Facilities — Men, Materials and Machines — to cold-head, machine, grind, roll-thread, heat-treat, clean, plate, polish — and to mass-produce in tenths if need be. A CORBIN precision part is not "dropped off the end" — yet our deliveries can be geared to your needs.

Let's talk it over.

P-3

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the nation, and that its restrictions and practices are crippling national recovery, will the Minister promise to draw from the ranks of technicians and managers the members of the advisory council of which he had spoken; and will he call in American and Continental experts, as may be found desirable?"

THE reply of the Minister to the sally was as follows:

"At this stage I do not think it would be possible to define the personnel of the control board. The need for having up-to-date technical advice will certainly not be overlooked."

There was an intensive effort in the House to obtain more details of the government's plan for public ownership, but without success. The strong implication of all the opposition statement was that, like Churchill accused, there is no alternative plan in existence. It seems likely that this is true and for natural reasons. The decision on the steel industry has been announced earlier than anyone thought possible last fall.

The motive for this early announcement is an anxiety to proceed with the heavy capital expenditures on modernization that are needed in the British industry. The government realized that whether the decision was to leave steel in private hands or to nationalize it, a prolonged period of indecision would be fatal when so much work is to be done.

Following considerable press clamoring for an announcement, the cabinet proceeded with the statement in the House. Probably it represents as much fact as has been definitely decided by the cabinet. There are certain ideas in existence as to who should be on the board, but at least part of the men who seem likely to be on it have not even been interviewed on the subject as yet. The Minister has ideas on what parts of the industry should be included in the program, but they are not yet established policy.

The Minister promised in his press conference that it would be possible to proceed immediately with much of the capital development, despite the fact that many firms will be uncertain as to their future. He stated that any firm would be certain that from now forward any corporation that went forward with an "approved" capital expenditure program could be certain of being recompensed for it, if taken over by the government.

The conservative press, enemies of the nationalization program, have suggested that the Labor Government is deliberately keeping the plan vague for political considerations. There is an important Labor party conference in June, and the *Financial Times* suggests that the plan when revealed will be so limited as to be unsatisfactory to the powerful Trades Union Council within the party. For this reason, the paper indicates that a hood will be kept over the details of the plan until after the conference.

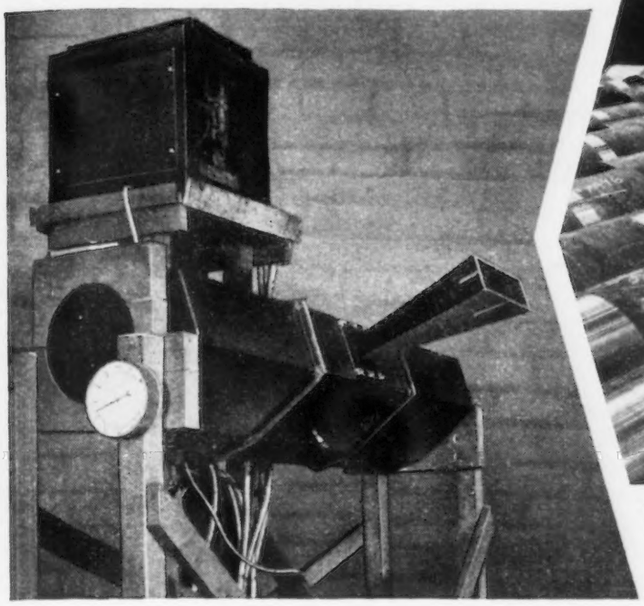
Moving cautiously the Minister of Supply indicated that the nationalized industry would maintain in general the international marketing arrangements which the British Iron & Steel Federation has fostered, if the general international trend is in that direction. His guarded reply indicated that the subject of cartels is being treated as a controversial matter over here.

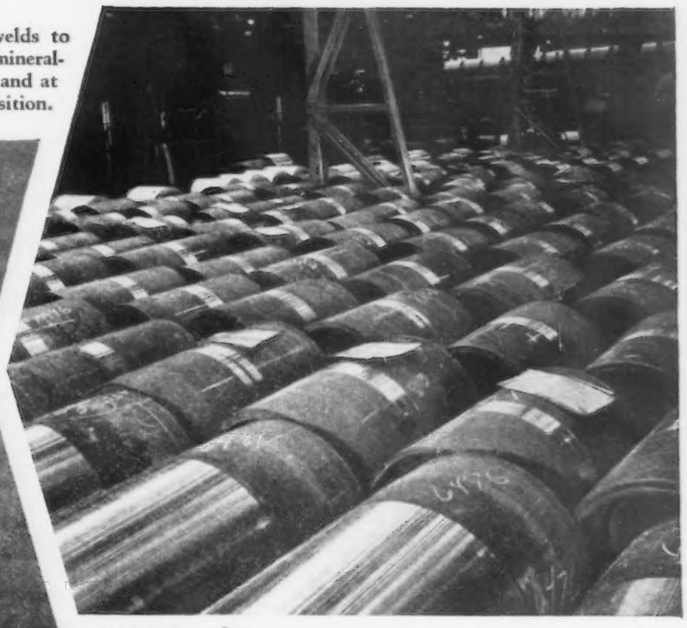
The conservatives in the House of Commons pressed their demands for an allotted time for debate until they got a flat refusal from the Prime Minister, who insisted that such a request should come through regular channels off the floor of the House. Mr. Churchill climaxed and halted the 70 min. show of forensics and parliamentary gymnastics with:

"Does not every word of this conversation and the statement by the Minister show that we are in the presence of a pure political ramp?"

THE AMERICAN TOUCH: *Two new British houses—the top one designed by the British Iron & Steel Federation of steel construction and suitable for urban areas; and the bottom one, the Airey house, of precast concrete construction and suitable for rural areas, are described by Britons as being similar to the wooden houses in this country.*

1928 When it became necessary to produce welds to meet early X-ray inspection, A. O. Smith developed a mineral-coated electrode which virtually eliminated porosity and at the same time materially increased the rate of deposition.





1946 The development of X-ray inspection, further SMITHway developments in mineral coatings for electrodes, and the SMITHway mastery of welding preparation and techniques, have made possible more than *one mile a day* of X-ray quality welding on torpedo airflasks in A. O. Smith plants.

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PERSONALS

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• **D. A. Sutch** has been appointed general superintendent of the Clinton plant, Wickwire Spencer Steel, New York. Mr. Sutch, who has been works manager of the Wickwire Spencer Aviation Corp., Newark, N. J., subsidiary of the Colorado Fuel & Iron Corp., succeeds **G. G. Lloyd,** who was recently transferred to the Buffalo plant as general superintendent.

• **Carl J. Recker,** who has been steel buyer for the Acklin Stamping Co., Toledo, for the past 5 yr, has been named purchasing agent. **George J. Bleim,** vice-president in charge of purchasing, has resigned.

• **C. E. Miller** has been made assistant general sales manager of Shaw-Box Crane & Hoist Div. of Manning, Maxwell & Moore, Inc., Muskegon, Mich. Prior to coming to the company in 1937, he was employed by Carnegie-Illinois Steel Corp.

• **Harry Goss** has been appointed regional supervisor in charge of the San Francisco office of J. A. Zurn Mfg. Co. He had been associated with the Plumbing Div. of Crane Co. for a number of years. **Neal Derby** has been named district representative in charge of the Seattle office of Zurn Mfg. Co., and **L. J. Campbell** has been appointed to the Chicago office in association with Fred Barr, regional supervisor in charge of the Chicago office. Mr. Campbell was formerly with the sales dept. of Crane Co.

•**James M. Bovard,** recently returned from service in the Army, has been elected a director of the Scaife Co., Oakmont, Pa. **John Hopkins** has been made vice-president in charge of operations; **John T. Stuart,** secretary and treasurer; **F. C. Campbell, Jr.,** assistant secretary; and **J. J. Dorn,** general superintendent of the company.

• **Russell Franks,** for the past year chief metallurgist of Union Carbide & Carbon Research Laboratories, Inc., has been appointed to the technical service and development dept. of Electro Metallurgical Co. Both companies are units of Union Carbide & Carbon Corp. Mr. Franks will make his headquarters in Pittsburgh.

WILFRED C. OWEN, executive vice-president, Detroit Steel Products Co.

• **Wilfred C. Owen** has been named executive vice-president of Detroit Steel Products Co., Detroit. Mr. Owen, who joined the company in 1914, has been successively assistant shop superintendent, shop superintendent, general factory manager, vice-president and director. He continues as a director of the company also.

• **Richard W. Darrow** has been appointed director of public relations for the Glenn L. Martin Co., Baltimore, and will take over his new duties May 1. He succeeds **Avery McBee,** who has accepted a position with N. W. Ayer & Son in Hawaii. Mr. Darrow has been assistant to the president of the American Meat Institute, Chicago. Prior to that he was assistant director of public relations for Curtiss-Wright Corp.

• **John W. Weigt** has been made manager of the Electric Storage Battery Co.'s New York branch, succeeding **D. P. Orcutt,** who has retired after 36 yr service with the company. Mr. Weigt entered the employ of the company in 1920 as a salesman and in 1944 took charge of railway, industrial truck and locomotive battery sales.

• **George R. King** has been made manager of chain link fence sales for Pittsburgh Steel Co., Pittsburgh. From 1922 to 1946 he was with Cyclone Fence Co., and since 1930 has been in charge of sales of its New York office except for the period 1943-45 when he served in the army.

• **Raymond J. Dervey** has been appointed to take charge of the American Hoist & Derrick Co.'s Pittsburgh office, relieving **Ralph Thomson** who has been made manager of the New York office. These changes are effective as of May 1. Previous to the war, Mr. Dervey served in various engineering capacities with the Amerada Petroleum Corp., Carnegie-Illinois Steel Corp., and J. T. Ryerson & Sons Co.

• **Arthur M. Krieger** has been appointed plant manager of the Estate Stove Co., Hamilton, Ohio. He comes to Estate after 25 yr of service with the U. S. Steel Corp., Pittsburgh, in the maintenance engineering and operating depts. Associated with Mr. Krieger in the operation of the Estate plant will be the following department heads: **Harry Dolf,** factory superintendent; **Paul Metz,** chief engineer; **Philip E. Biegel,** superintendent of production planning; **James P. Fath,** purchasing agent; **Richard F. Blankenship,** chief inspector.

• **Elmer B. Jones,** traffic manager of Norton Co., Worcester, Mass., for 11 yr, has been made general traffic manager. **J. Douglas Dawson,** engaged in special sales work since 1944, has been made traffic manager for the Abrasive Div., and **Hugh A. Allen,** assistant traffic manager of the Machine Div., has been appointed manager for that division.

• **Erskine Ramsay** has been elected chairman and consulting engineer of Alabama By-Products Corp., Birmingham. **J. W. Porter** has been elected president; **H. L. Morrow,** executive vice-president and treasurer; **H. M. Cowart,** vice-president, assistant secretary and assistant treasurer; **P. H. Neal,** vice-president and assistant to the president; **P. H. Haskell, Jr.,** vice-president; and **J. A. Shook,** secretary.

EVERETT C. GOSNELL, manager, Chemical & Process Equipment Div., Colonial Iron Works Co.

• **Everett C. Gosnell,** formerly manager, Chemical Div. of Lukens Steel Co. and subsidiaries, has joined the Colonial Iron Works Co., Cleveland, as manager, Chemical & Process Equipment Div.

• **Ralph K. Alexander,** until recently district sales manager for Ceco Steel Products Corp. at Oklahoma City, Okla., has been appointed the firm's Texas manager with headquarters in Houston. He replaces Russell L. Jolley. **William A. Smith,** assistant manager at Washington, has been named assistant to Mr. Alexander.

• **Richard F. Garretson** has been appointed Eastern regional manager of Ransome Machinery Co., Industrial Div., Dunellen, N. J., a subsidiary of Worthington Pump & Machinery Corp. He is in charge of sales of welding and work positioning equipment with offices at Philadelphia. Mr. Garretson joined Ransome in 1936 and is a pioneer in promoting positioning equipment.

• **C. M. Christensen,** who has been Denver district manager of the Industrial Products Sales Div. of the B. F. Goodrich Co. since 1941, has been appointed special mining representative in the Rocky Mountain area. **Col. John S. Gulledge,** St. Louis district manager before he entered the service in 1942, has been named acting district manager at Denver.

• **George W. Stamm** has been appointed assistant branch manager of the Crucible Steel Co. of America, Cleveland. He was previously a service engineer of the Tool Steel Div.

• **Douglas C. Ogilvie** has been appointed Eastern division manager of the Gasflux Co., with his headquarters at Newark, N. J. He was formerly connected with the Chas. W. Krieg Co. of Newark, in the capacity of welding consultant.

• **Homer W. Northrup,** formerly with the melting dept. of the Iron & Steel Foundry Div. of the Crane Co. at Chicago and at its plant in Chattanooga, Tenn., has joined the Chicago technical section of the International Nickel Co., Inc. He will be associated with the foundry activities of INCO in the Chicago territory.

• **David Adams,** assistant treasurer since last July, has been appointed assistant secretary and assistant treasurer of the Tennessee Coal, Iron & Railroad Co., Birmingham. He succeeds the late **Terry E. Noell** as assistant secretary of TCI, and also succeeds Mr. Noell as assistant secretary and assistant treasurer of the Tennessee Land Co. and the Universal Exploration Co.

• **Torsten F. A. Edvar** has been appointed to the engineering staff of the Ajax Electric Co., Philadelphia. He was formerly chief engineer of the Harold E. Trent Co., also of Philadelphia.

• **Walter Pestrak** has been appointed to represent Progressive Welder Co., Detroit, in its new Southeastern Ohio and Western Pennsylvania sales district. His headquarters will be in Canton, Ohio. Mr. Pestrak has been associated with the Duer Engineering Co. as Progressive's field sales engineer in this area for the past several years.

• **Robert H. Cowdery** has retired as manager of the Geneva works, American Fork & Hoe Co., Cleveland. In addition to managing the Geneva plant, he was also a director and vice-president of the company. He is succeeded as manager by **G. W. Yearley,** who has been with American Fork & Hoe for many years.

L. C. KROES, manager of central regional sales, Detrex Corp.

• **L. C. Kroes** has been appointed manager of the central regional sales of Detrex Corp., Detroit. He has been with the corporation since 1937 serving as a representative in the eastern region for 3 yr when he returned to manage the Michigan division in 1942.

• **Frank H. Hastings** has been appointed sales engineer of New Britain-Gridley Machine Div., the New Britain Machine Co., New Britain, Conn., with headquarters in Dayton. His territory includes western Ohio, Indiana, and northern Kentucky. **Charles W. Coffin** and **William H. Nettle** have been appointed sales engineers for New Britain automatic screw and chucking machines in the Michigan territory, with headquarters in Detroit.

• **L. R. Clausen** has been re-elected president of the J. I. Case Co., Racine, Wis. Other officers elected were **Theodore Johnson,** executive vice-president; **D. P. Davies, W. L. Clark** and **Harry G. Barr,** vice-presidents; **William B. Peters,** secretary; and **W. E. Anderson,** treasurer.

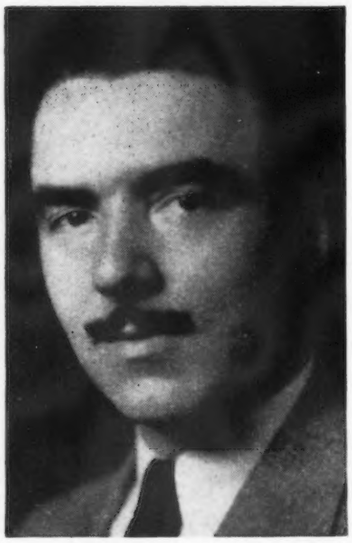
• **Harry W. Ellis** has been re-elected chairman of the board and **Joseph A. Cutler,** president and general manager of the Johnson Service Co., Milwaukee. **Richard J. Murphy,** formerly secretary and assistant treasurer, has been elected secretary and treasurer.

• **E. J. Stone** has been appointed manager of Ilg Electric Ventilating Co.'s Detroit office as a successor to A. H. Kirkpatrick. During the war he served as general foreman of the forge and machine shops in the Bethlehem plant of the Bethlehem Steel Co. **Capt. W. L. Hochschild** has become associated with the Chicago branch office of ILG as a sales engineer. **John D. Briggs** has been assigned to the branch office in Philadelphia. His previous business connection was with Sears Roebuck & Co., where he served as employment manager and service manager. **William S. Gorham** has been appointed sales engineer in the branch office in Los Angeles. He entered the engineering dept. of Lockheed Aircraft Corp. in 1944 where he remained until making his present association with ILG.

• **Edward J. Dudley** has been appointed public relations representative of the American Locomotive Co. at Schenectady. Prior to entering the Army in 1941, Mr. Dudley was a reporter for the Rochester Democrat and Chronicle.

• **Joseph M. Perrone** has been appointed director of research of Watson-Standard Co., Pittsburgh. For the past 3 yr he had been doing research and development work on protective coatings at Mellon Institute of Industrial Research.

• **H. T. Lintott,** formerly manager of industrial relations for Columbia Steel Co., has joined the Pacific States Steel Corp., Niles, Calif., as manager of operations.



W. C. LANDIS, vice-president in charge of manufacturing, Westinghouse Air Brake Co. and Union Switch & Signal Co.

• **W. C. Landis** has been elected vice-president in charge of manufacturing of Westinghouse Air Brake Co., Wilmerding, Pa., and of Union Switch & Signal Co., Swissvale, Pa. Mr. Landis became associated with the air brake concern in 1915 as a trucker and general utility man. He was named assistant works manager in 1930 and works manager in 1940. In 1942 he assumed the position of works manager at Union Switch & Signal Co. also.

• **Donald H. Dalbeck** has been made treasurer of the Reed-Prentice Corp., Worcester, Mass., to succeed **Charles S. Payson,** who has retired.

• **A. J. Wettlaufer** has been appointed sales manager of Detroit Sales Engineering Co. Formerly sales manager of Briggs Mfg. Co., where he served over 25 yr, Mr. Wettlaufer will take over direction of all sales and service activities.

• **Karl J. Schmaelze,** formerly New York division manager, industrial and technical dept. of Shell Oil Co., has been made supervisor of sales and director of engineering applications and research of Strainer Products Corp., Montclair, N. J.

• **Claude A. Gates,** New York City, manager of Zone 1 of the Wheelco Instruments Co., has been appointed vice-president. **C. H. Joy,** Cleveland, manager of Zone 2, and at present a director, has also been appointed vice-president. **R. A. Schoenfeld,** Chicago, manager of Zone 3 and a vice-president, has been named a director of the company, while **Charles L. Saunders,** vice-president, has been appointed to the office of executive vice-president. Mr. Saunders' headquarters will be at the main office and plant in Chicago.

• **J. K. Redding** has been appointed field representative of SKF Industries, Inc., Philadelphia office. Other new field representatives appointed are: **L. E. Jacobs,** Buffalo; **W. S. Corneille,** Milwaukee; **F. O. Hamlet,** Chicago; **G. E. Mayhew,** Cleveland; **B. J. Fraher,** Detroit; and **C. L. Eberlein,** Atlanta.

...OBITUARY...

• **Paul Barnhardt,** secretary, treasurer and director of the Riverside Metal Co., Riverside, N. J., died Apr. 8.

• **James A. Millar,** 79, former superintendent of the New England Butt Co., Providence, died Apr. 8.

• **Herbert C. Ryding,** 82, former president of the Tennessee Coal, Iron & Railroad Co., Birmingham, died Apr. 12. He became assistant to the vice-president of the Tennessee company in 1907. In 1917 he became vice-president and in 1930 he was elevated to president, which position he held until his retirement in 1933.

• **William F. Tannhauser,** 72, vice-president of the Kendall Corp., Milwaukee, until his retirement a year ago, died Apr. 8 at a Milwaukee hospital.

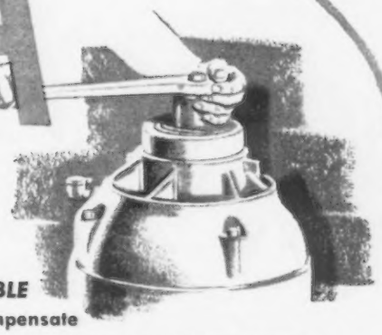
• **J. S. Fraser,** 67, metallurgist and consultant on steel plant construction and operating methods, died recently in Longview, Tex. He had been associated with Carnegie Steel Co., Pittsburgh Steel Co., Trumbulls Cliffs Furnace Co., Republic Steel Corp., and more recently with the Sheffield Steel plant at Houston.

• **Thomas C. Eayrs,** 62, budget director for 11 yr of the Buffalo Foundry & Machine Co., and its successor, the Buflovak Equipment Div. of Blaw-Knox, died Apr. 13.

• **Jean R. Hopkins,** 57, advertising manager of the Chicago Belting Co., died recently. He was the founder and the first president of the Industrial Advertisers Assn.

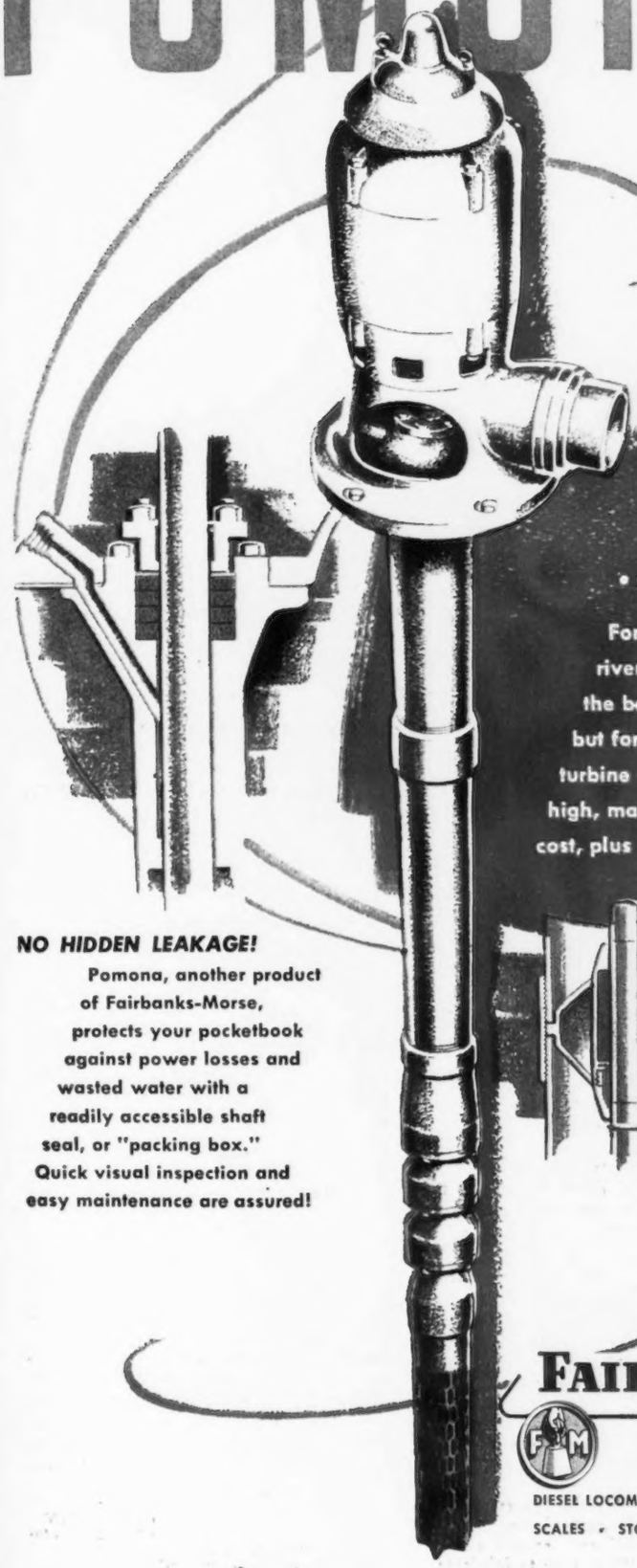
• **Richard A. Van Houten,** 78, former vice-president and general manager of the Sellers Mfg. Co., Chicago, died Apr. 4 at his home in Marinette, Wis. He had retired 8 yr ago.

POMONA



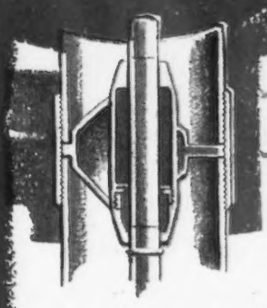
ADJUSTABLE

You can compensate your Pomona pump for wear—restore proper running clearance when at last it's necessary—by one simple "topside" adjustment. No need to pull the pump to eliminate recirculation; no high adjustment costs—and valuable pumping time is saved!



Where there's a well ...here's the way!

For pumping water from wells, pits, sumps, lakes, rivers, etc., here's the way to cut costs per gallon to the barest minimum—not only in the first year, but for many, many years to come! Pomona vertical turbine pumps have the combination you're after—high, maintained efficiency for continued low power cost, plus lowest yearly maintenance expense!



NO HIDDEN LEAKAGE!

Pomona, another product of Fairbanks-Morse, protects your pocketbook against power losses and wasted water with a readily accessible shaft seal, or "packing box." Quick visual inspection and easy maintenance are assured!

WHAT DO YOU NEED? **The patented Pomona revolvable, water-lubricated rubber bearing with double (inside and out) bearing surfaces means quiet vibration-free shaft support under all conditions. Fairbanks-Morse vertical turbine pumps are built in sizes from 4" to 36"—with oil or water-lubrication—semi-open or enclosed impellers. Call your nearest Fairbanks-Morse office or your Pomona dealer for information on the pump best fitted to your job.**

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SCALES • STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT

Dear Editor:

TOOL DRAG LINES

Sir:

In reading one of your recent articles, "Borizing Setups Increase Production and Accuracy," I came across a term I did not understand too well. There is reference in the article to "elimination of tool drag lines." What is the cause of tool drag lines and what type machines are likely to have them . . . ?

G. M. GOLDSMITH, JR.
1734 Bella Vista,
Cincinnati

● The term "tool drag lines" is applied to marks or shallow grooves made on the surface of a work piece when the tool is dragged backwards across the finished surface at the completion of the cut. Such marks occur most frequently in turning, facing and boring operations as performed on a lathe or similar machine. They can be eliminated by backing the tool out of contact with the work before being reversed. —Ed.

CARBURSINTERING

Sir:

I would like to bring to your attention the fact that my article "Carbursintering of Iron Powders," published in the issue of Feb. 28, was extracted from a thesis submitted in partial fulfillment of the requirements for the degree of master of science, Stevens Institute of Technology. Also, the caption for fig. 4 should have read "as annealed," instead of "as quenched."

ALAN S. MARGOLIES
Powder Metallurgy Laboratory
Stevens Institute of Technology,
Hoboken, N. J.

FACE MILLING

Sir:

Will you please send me a copy of the article on angle of approach for negative rake carbide milling cutters recently published under the authorship of Fred W. Lucht.

F. C. FRIEDLI
Tool Engineering Dept.
International Business Machines Corp.,
Endicott, N. Y.

● We are sending tear sheets of the two-part article "Effect of Work Position in Face Milling."—Ed.

THIN DIAMETER BEARINGS

Sir:

If possible, I would like to secure tear sheets of the article which appeared in the Feb. 21 issue, p. 61, entitled "Extra Thin Large Diameter Bearings."

M. T. LUDWICK
Secretary
Indium Corp. of America,
New York

INVESTMENT BINDERS

Sir:

In your issue of Mar. 7 you mention under your column "Newsfront" that precision-casting producers are meeting with encouraging results in the development of new investment binders. I would appreciate it if you could give me more specific information concerning this subject.

FELIX BARDACH
102 W. 80th St.,
New York 24

● We cannot give you any further details at this time. However, we are following this development very closely and as soon as it has reached the production stage, we hope to have a detailed article describing it.—Ed.

STEEL JOBBERS

Sir:

We would like to obtain a list of steel warehouse jobbers in the entire country. Kindly advise if you can supply us with such a list.

N. MORE
Federal Auto Products Co.,
Chicago

● The best source of a listing of primary steel warehouses would be the American Steel Warehouse Assn., Cleveland; for secondary jobbers you might contact the Steel Products Warehouse Assn., Cleveland.—Ed.

NI-FE LAMP WIRE

Sir:

We read in the Feb. 28 issue of "Newsfront" of a new nickel-iron alloy for use in the lamp industry. Would you furnish us with the manufacturer's name?

J. COLEMAN
Philips Laboratories, Inc.,
Irvington on Hudson, N. Y.

● Driver-Harris Co., Harrison, N. J., developed the wire.—Ed.

TUBES FOR 2000° F

Sir:

We are interested in procuring tubes of 2 to 3 in. diam, length 18 to 20 ft, which will withstand a constant temperature of 2000°F in an oxidizing atmosphere, in other words we wish to pass air and gas through these tubes. Do you know of any metal which will stand this temperature, or can you refer us to someone who might be in a position to supply these tubes? There is no particular pressure involved.

JAY HAUSAM
Purchasing Agent
Danciger Oil & Refining Co.,
Tulsa, Okla.

● AISI 310 would probably be most suitable. This steel is generally considered satisfactory for continuous service up to 2100° F and is relatively easy to fabricate. Sources of supply for this steel, in seamless tube form are Babcock & Wilcox Tube Co. (Croloy 25-20) and Steel & Tube Div., Timken Roller Bearing Co. (Timken 310); sources for welded tubing are Republic Steel Corp. (Enduro NC-3), Rustless Iron & Steel Corp. (Rustless 25-20) and Allegheny Ludlum Steel Corp. (Allegheny Metal 25-20) —Ed.

HEAT TREATMENT

Sir:

We have been very much interested in the Morris Cohen and Paul Gordon articles on "Heat Treatment of High Speed Steel." Are reprints available and what is the price?

W. P. KNECHT
District Sales Manager
Universal-Cyclops Steel Corp.,
Worcester, Mass.

Sir:

If the article on "Heat Treatment of High Speed Steel" is going to be put up in booklet form, I would like a copy. If not, kindly send tear sheets.

F. C. KENNEDY
Production Manager
Warren Axe & Tool Co.,
Warren, Pa.

● Reprints of the article "Heat Treatment of High Speed Steel" have been made by the Vanadium-Alloys Steel Co., Latrobe, Pa. Your request is being referred to them. These reprints carry all five parts of the series.—Ed.

IRON AND NICKEL POWDERS

Sir:

Please send us a tear sheet of the article "German Iron and Nickel Powders" by T. P. Colclough printed in the Feb. 21 issue.

ALICE C. OLSON
International Nickel Co., Inc.,
New York

METAL FINISHING

Sir:

We would like to get three copies of the article entitled "Metals, Finishes, and Finishing Processes." We are enclosing a cheque in the amount of $1.50.

D. A. WILSON
General Purchasing Agent
Canadian Westinghouse Co. Ltd.,
Hamilton, Canada

Sir:

We have read with interest the articles appearing in the issues dated Sept. 6, 13, 20 and 27, entitled "Metals, Finishes and Finishing Processes." If reprints of these articles are available, we should be very grateful if you could forward copies. May we congratulate you on the informative nature of your technical articles which have proved to be extremely useful to us.

C. HOLMAN
Chief Inspector
Magnal Products Ltd.,
Warmley, Bristol, England

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Electric Heaters
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Cabinets
Motor End Covers
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and many others

OAKITE PRODUCTS, INC., 30H Thames Street, New York 6, N. Y.

This Industrial Week . . .

- ***Steel and Coal Strike Loss 8.5 Million Tons***
- ***Effects to Be Felt in Trade for Some Time***
- ***Alloy Steel Price Increase to Be Revised***

BY the end of next week the coal mine stoppage will have cost the country more than 1,000,000 tons of steel ingots and in terms of finished steel products about 700,000 net tons. Before the strike is settled, the ingot loss may exceed 2,000,000 tons.

Considering the 7,500,000 tons of steel ingots lost because of the steel strike earlier this year, and the 1,000,000 tons which will be irretrievably lost by the end of next week because of the coal strike, this 8,500,000 tons of raw steel represents the disappearance of approximately 5,900,000 tons of finished steel —the total shipments to the automotive industry during the full year of 1939.

While some steel companies continue to operate at high levels this week, by the end of next week at least two large firms will be forced to cut production by as much as 50 pct. The U. S. Steel Corp., which began to reduce activity early this month, will by the end of this week be operating at new lows in the Chicago and Pittsburgh districts. The gamble which many companies took that the coal strike would be short-lived has been definitely lost. The steel ingot rate is down 5 points this week to 74 pct.

Indications this week are that the coal strike will run well into May. Governmental plans for ending the tie-up so far have no substance, and the controversy has settled down to the usual coal dispute pattern—a waiting game. In past bouts with the coal operators, Mr. Lewis has held out for his demands without budging an inch, despite the drastic effects of the coal shutdown.

There is more than a 50-50 chance that the steel industry will become paralyzed and reduced to an insignificant operating level before the coal situation is cleared up. Several companies in the east and in some other parts of the country will be able to operate on cold pig iron and scrap charges, but even these firms will be hampered due to the growing scarcity of pig iron due to blast furnace shutdowns.

FOR some peculiar reason the significance of the coal stoppage effect on steel production seems to be lost upon governmental officials and the public. Apparently a complete shutdown of the nation's steel mills will be necessary to convince the parties involved of the seriousness of repeated interruptions of the supply line of steel so urgently needed for the production of consumer and producer goods.

Many small plants throughout the country are finding it impossible to obtain various types of steel products in order to round out their own production program. Unless some means is found to take care of these small consumers, wholesale shutdowns and curtailments will result. Large users of steel are in for a series of headaches within the next few weeks because many of their sources of steel supply will be curtailing operations and shipments.

Even after a settlement in the coal situation has been reached, it will take from two to three weeks for steel companies to regain their normal level of operations. This will mean a further revision of current shipping schedules which will have the effect of again extending deliveries on all steel products.

Still struggling with the problem of getting a distribution of steel products which will bring the greatest return in order to compensate for the wage advance, steel firms are running into an unbalanced product mix. The latter has resulted in the elimination of some products for sale with extra emphasis on the output of other items. This situation has left many steel consumers without sources of supply for component parts in their manufacturing activity.

THE discussions between the OPA and the Steel Industry Advisory Committee over the adequacy of the 4 pct price rise on alloy steel will soon bear fruit. Around May 2 the OPA is expected to revise the increase on alloy steel from 4 pct to 8.2 pct. Many steel firms have not billed their customers on the 4 pct increase basis, but have notified them that when the price question is finally settled, additional billings to compensate for the price increase will be made.

It is certain that at the end of the 90-day period from the time steel prices were increased, the steel industry will require further action from OPA on the steel price structure. It may be that the unbalances claimed by the industry will be straightened out by a revision in steel price extras.

The strike, wage and price situation in the nonferrous industries is very similar to that of the steel industry some three months ago, with the establishment of fact-finding boards to study the wage and price structure of copper mines and smelters. Price increases have not now been granted to the brass mills, and all but one major wage adjustment has been settled in the industry. Other stoppages in the lead and zinc mines are awaiting the establishment of a pattern in the copper and brass industry.

Meanwhile, order backlogs for copper and brass products are seriously behind schedule and with more than 50 pct of the domestic mine production closed down, it is believed that the shortage of copper will reflect itself in a larger curtailment of brass mill production than is now apparent.

• **STEEL PAYROLLS REFLECT STRIKE**—Employment and payroll figures of the steel industry for January and February reflect the national steel strike which started Jan. 21 and ended in mid-February. The industry's total payroll was $169,890,500 for two months, January and February 1946, against $288,681,300 for the two months of January and February 1945, and $122,527,700 in December 1945. Average earnings of employees receiving hourly, piecework or tonnage wages in January and February were 131.4¢ per hr, compared with 124.1¢ per hr in January and February 1945, and with 122.4¢ per hr in December 1945. Wage earners worked an average of 24.0 hr per week in January and February, compared with 47.5 hr per week in January and February 1945, and 39.0 hr per week in December 1945. Average employment in January and February was 522,300, compared with 565,100 in January and February 1945, and $544,900 in December 1945.

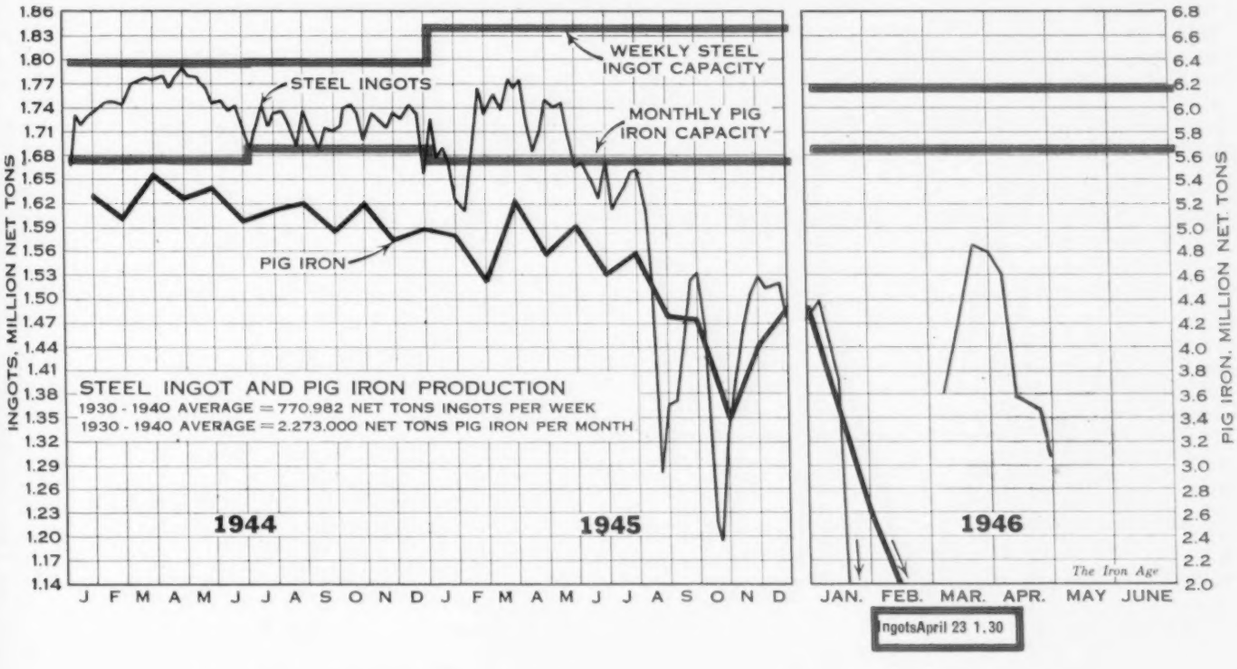
• **RETURN OF THE NATIVES**—With two returned steel executives already at their desks at CPA, plans for enlarging the agency's steel branch to meet emergency needs are rapidly nearing completion. Plans for recruiting these men were outlined at the Iron & Steel Industry Advisory Committee meeting on Mar. 27. A. A. Archibald, Jones & Laughlin Steel Corp., has joined CPA as a consultant and will devote his time to meeting all types of emergency problems. Dan Lacy, Youngstown Sheet & Tube Co., returned to work with pipe and tubular goods and certain sheet products. Negotiations for two additional men to work in warehouse and construction problems will be completed this week. This will wind up CPA's emergency recruitment program. James Sedgwick, formerly with the Wheeling Corrugated Co., has come to CPA from OPA to work on wire and wire products. Mr. Sedgwick did not come to CPA under the emergency program but as a normal replacement.

• **POSTPONES RATE REDUCTION DATE**—Upon request of the U. S. District Court for the western district of Pennsylvania, the Interstate Commerce Commission has postponed from May 1 until June 1, the effective date of its order reducing all-rail rates from the Pittsburgh, Freeport and Leetonia districts in Pennsylvania and ex-river rates from Conway and Colona, Pa., on bituminous coal to the Youngstown, Ohio, district. The commission recently denied railroad petitions and intervening steel company petitions for reargument and reconsideration of the case.

• **FAIRLESS SPEAKS**—"A total of 23 out of 32 blast furnaces which were operating before the coal strike, are being banked in Pittsburgh district operations of U. S. Steel subsidiaries; 9 furnaces are already out of blast in the Chicago District and more must be shut down during the next week. At one plant within the corporation 23 openhearth furnaces have been taken out of production. The total amount of steel lost at all U. S. Steel operations since the strike began Apr. 1 is estimated at 402,000 tons."

• **MEASURING MARKET OPPORTUNITIES**—Designed as a guide in appraising new business locations and measuring market opportunities, the Office of Small Business, Dept. of Commerce, has compiled basic business and economic data of all metropolitan areas of more than 100,000 population. The information has been assembled in an 85-page booklet, "Metropolitan District Basic Data Sheets" and is available at no charge from the Inquiry & Reference Service of the Dept. of Commerce. The data sheets list population, racial, housing, manufacturing, agricultural and trade characteristics for 87 areas in 34 states.

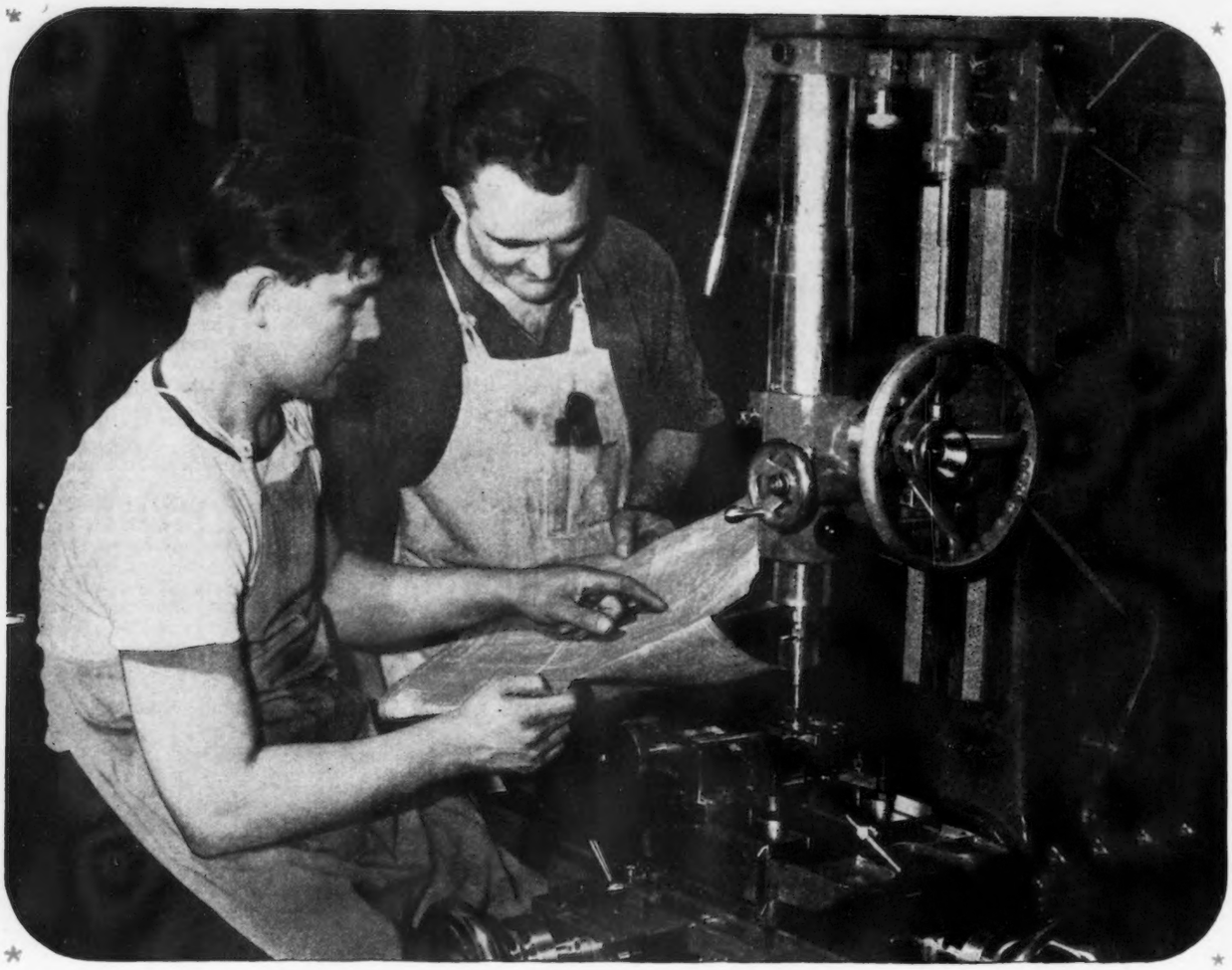
• **LAKE VESSEL SOLD**—American Steel & Wire Co. has sold the motor ship "Steel Chemist," last of a fleet of four St. Lawrence River canal size vessels operated on the Great Lakes by U. S. Steel subsidiaries, to Inland Steel Co. The "Chemist" and its sister vessels introduced the crane type ship on the Great Lakes for loading and discharging of cargo. Its carrying capacity is 3000 net tons. The ship's 250 ft length and 42 ft beam enable it to navigate the St. Lawrence canal.


WEEKLY STEEL INGOT CAPACITY
STEEL INGOTS
MONTHLY PIG IRON CAPACITY
PIG IRON
STEEL INGOT AND PIG IRON PRODUCTION
1930 - 1940 AVERAGE = 770,982 NET TONS INGOTS PER WEEK
1930 - 1940 AVERAGE = 2,273,000 NET TONS PIG IRON PER MONTH
INGOTS, MILLION NET TONS
PIG IRON, MILLION NET TONS
1944
1945
1946
J F M A M J J A S O N D J F M A M J J A S O N D
JAN. FEB. MAR. APR. MAY JUNE
The Iron Age
IngotsApril 23 1.30

Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
April 16.....	70.5	76.0	71.0	89.5	94.0	104.5	95.0	87.0	98.0	59.0	92.0	72.0	97.0	78.5*
April 23.....	61.5	72.0	63.5	84.0	94.0	106.5	81.5	63.0	98.0	55.0	86.0	72.0	96.5	74.0

* Revised



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ALLEGHENY LUDLUM STEEL CORPORATION
General Offices
Brackenridge, Pennsylvania

W&D 9332 F

Britons Hear Steel Nationalization Intent

o o o

By JACK R. HIGHT

o o o

ANNOUNCED THE BLOW: *Mr. John Wilmot, Minister of Supply and Aircraft Production, announced the Labor government's intention to nationalize the British iron and steel industry.*

o o o

London

• • • **Announcement of the** Labor Government's intention to nationalize the British iron and steel industry within the present term of Parliament has culminated weeks of nervous tension in the industry here. The statement was made by the Minister of Supply, John Wilmot, under whose jurisdiction the industry will eventually find itself, but no details were given as to the nature of the plan, other than the forecast of "a large measure of public ownership for the industry."

An interim plan was announced by the Minister to function for the control of the industry during the period before the legislation is introduced in Commons for the nationalization. A board is to be appointed in the next few weeks which will replace the Iron and Steel Control, directing body for the industry during the war. It will also advise the Minister of Supply in matters relating to the nationalization. Its duties will include the determination of the exact portions of the iron and steel industries to be taken under public ownership. The board is also to press forward immediately on modernization of the industry.

No details were given as to the composition of the board, except that the minister referred to the need for expert technical advice in the definition of the limits of nationalization.

The statement of the government's intentions and future policy in regard to the steel industry came after weeks of press conjecture about the future of the industry and mounting demands for a policy statement. The British steel industry, thrqugh its trade association, the British Iron & Steel Federation, had drawn up a program of modernization at the request of the coalition government, and this report had been in the hands of the cabinet for some months. Before the industry proceeded with the expenditure of the £168,000,000 ($672,000,000) called for in the program, it was anxious to get a definite policy statement as to the possibility of nationalization of the industry.

Mr. Wilmot's statement in the House was designed to give as nearly as possible that answer, at least to inform the country of what had been decided to date.

In a press conference held immediately after his appearance in the House, Mr. Wilmot outlined to reporters the basic factors that had led the government to its decision. He stated three possibilities which were considered in succession in arriving at the position.

The first of these would have been to allow the industry to revert from its present position of

Press Comments from London on Steel Nationalization

Times . . . (Conservative)

" . . . The policy announced amounts to control without a plan and without any idea as yet of a controlling body, followed by nationalization of something to be hereafter defined on a policy still to be formulated. . . . It must be feared that the industry will be partially paralyzed in its development and re-equipment possibly for several years ahead."

"... Now that this grave decision has been taken it is essential . . . to concentrate attention primarily on the real national aim, which is to make the British steel industry within the shortest possible time fully efficient and internationally competitive."

Manchester Guardian . . . (Independent)

"This is the most audacious step the government has yet taken in its domestic policy. The step is within its mandate, but the practical difficulties of taking over such a complex manufacturing industry are so appalling that this particular point in the party's program had always been regarded, even within the Labor movement, as an objective to be reached by stages."

"In its (the cabinet's) final decision the desire to forestall the growth of a 'State within a State' such as these highly organized heavy industries have tended to form in many countries must have weighed heavily."

News Chronicle . . . (Liberal)

"We do not know yet whether it (the government) envisages a loose control, giving ample scope for the exercise of initiative and enterprise by the industry itself, or whether its plans are likely to mean in practice a tight and cramping bureaucratic control. Everything turns on that."

Financial Times . . . (Conservative)

"This is a clear-cut case of political dogma overriding all other considerations. Not a single person advocating the nationalization of this industry has yet stated publicly how it can be done, or how it would be in the national interest, even if it could be done. . . . Political mysticism—or is it purely political opportunism?—has prevailed over all realistic arguments."

For the Defense of the British Steel Industry

Statement by Mr. Ellis Hunter, President of the British Iron and Steel Federation

"The iron and steel industry emerged from the war with an enviable record of achievement in meeting the country's requirements. Current production is high in spite of shortages of fuel and imported ore, and an outstanding contribution has already been made to the exports of the country.

"The record of relations between labor and management in the iron and steel industry is one of which all engaged in it are proud.

"The nation had in wartime the benefit of the progress in the industry made in the 5 yr before the war, when efficient and up-to-date plants were built in various parts of the country. During the war, as a matter of national policy, the industry's modernization program had to be suspended for the time being. The industry has welcomed therefore the opportunity of putting before the government its own proposals for further modernization and systematic development over the next 5 yr. These plans are far-reaching in their range and effect. They are based upon the highest technical advice.

"In its relations with the government, the industry has always responded to the opportunity of disclosing fully its plans and policies with a view to keeping these in line with the best interests of national requirements.

"The iron and steel industry believes that achievement of the highest standards of efficiency and quality can be secured by continuity in the policy pursued by the government and the industry together before the war. It cannot support a policy of public ownership as contributing to these ends and views with the greatest concern a period of acute controversy on matters of ownership in this highly complex industrial structure, controversy which will divert efforts from the true needs of the nation and disturb confidence in a very wide range of allied trades."

continued wartime controls to the prewar state, with the industry regulating itself through the Iron & Steel Federation. He briefed the needs for substantial capital investment, and suggested that there would inevitably be needs from the industry for various forms of government support. Pointing out the national importance of the steel industry, he indicated that the government did not feel that the industry could be expected to continue the heavy capital development in a possible slump. He stated that this was one of the important considerations involved in rejecting the first course.

His second choice was to leave the industry in private management, but to superimpose upon the present structure of the industry a national steel board which would control the industry in the public interest. While this proposal had many advantages, primary of which that it would be simple of establishment, it would suffer from an inevitable division of responsibility from ownership. Thus the government does not feel that a group of private shareholders should be compelled to make capital investments by a control organization superimposed on them by the government. This was the major consideration in rejecting the National Steel Board-private ownership plan.

The last alternative was the public ownership upon which the government has fastened itself. Referring to the comprehensive report which the Federation prepared for the government, the Minister stated that basically the government is in agreement with all of the principles laid down in it. In the application of the plan, however, the Labor cabinet decided that the best results could be obtained through public ownership.

The Minister refused to commit himself on the time which might be required to solve the technical difficulties in defining what is to be taken over and what is not. He indicated that the legislation to take over the industry would certainly come within the term of the present parliament (four years) but not during the present session (which lasts until autumn).

Indicating that the interim control board would include trade union representatives, he stated that it was possible that some of the same men who served on the interim board might also be a part of the permanent public ownership program. He was stopped abruptly in the middle of this statement by his parliamentary secretary when on the verge of saying they might be members of the permanent national steel board.

Without mentioning any existing proposals, Mr. Wilmot indicated that he definitely did not rule out the possibility of establishing more than one government corporation to take over the industry. He indicated that it would be unwise at present to assume that either the multi-corporation form passed for the civil aviation industry or the structure planned for the nationalization of the coal industry would be the pattern for steel. Each industry is said to tend to require a pattern of its own.

There has been a flood of rumor about the extent of the nationalization, and numerous questioners tried to ascertain just how far into the industry the public ownership would penetrate. It was considered obvious from the formal statement's phraseology, "a large measure of public ownership," that certain limitations were involved. Reporters tried hard to press the Minister into a statement as to whether the ingot, or the blooming mill stage would be a dividing line, but without success.

It was indicated that generally speaking the engineering industries would not be included, but the foundry trades seem likely to be involved.

Tubing, Wire Made Surplus

Washington

• • • **The War Dept.** has turned over to the War Assets Administration as surplus, steel tubing and basic metal products such as cold-drawn and hot-rolled steel, zinc slab, brass strips and bar solder with an original cost of approximately $1,400,000. Also declared surplus recently by the War Dept. was wire of several types, such as poultry netting, copper wire and wire mesh costing $750,000.

These products will be offered to priority claimants, veterans and dealers in the near future.

CED Favors Continuation Of Liberalized OPA to Avoid Price Rise

New York

• • • **Long continued peacetime** price control is a threat to all our freedoms, but abandonment of all such control by June 30 of this year would leave the nation unprotected against a dangerous rise in prices. Retention of some controls until the spring of 1947 and in the case of rents for an even longer period is necessary, but present procedures must be streamlined and existing OPA price standards liberalized, according to Paul G. Hoffman, chairman of the research committee of the Committee for Economic Development.

The following conclusions were emphasized by Mr. Hoffman:

(1) Price control has no permanent place in the peacetime American economy. The restoration of an economy of free prices in the near future must be a primary objective.

(2) The abandonment of price control on June 30, 1946 would leave this country unprotected against a dangerous rise in prices.

(3) A quick and orderly termination of price control can only be assured by a positive program embracing both bold measures of decontrol and courageous fiscal and monetary policies to combat inflation.

(4) During the limited period of its extension, the inequities and obstacles to production which result from price control must be reduced by streamlining present procedures and liberalizing existing standards.

Supporting its position, the committee said that prices cannot be centrally controlled for any sustained period without inefficiency, inequity, breakdown of respect for law, and most important, serious danger to personal and political freedoms. In the opinion of the committee there are hazards in eliminating price control too soon, but the dangers in continuing it too long are even greater.

"We look forward," Mr. Hoffman continued, "to a further expansion of production and must do everything possible to hasten this expansion. But it is not clear that production increases will of themselves, in the near future, eliminate the excess of demand. Expanding production will bring higher incomes, increased bank credit, and general optimism, and it might conceivably increase rather than decrease inflationary pressure."

The committee makes four specific recommendations as to changes needed "so that we can live with price control for a limited period." These changes are:

(1) Follow a resolute and affirmative policy in progressively suspending price ceilings. Remove controls first from those commodities which are not essential in the basic standard of living or critical in reconversion, or which show an approximate balance between demand and supply. The principle of vigorous, progressive liquidation should apply to cost-of-living subsidies as well as to price ceilings.

(2) Extend the use of automatic pricing procedures, under which producers compute their own ceilings, subject to OPA review, and with heavy penalties provided for fraud.

(3) Base price determinations on the actual record of industry operations, adjusted for definite abnormalities visible in the record, but without attempting to forecast the future development of costs and revenues.

(4) Liberalize the standards for price relief.

With respect to the last of these recommendations the policy statement says: "The general standards used by OPA in considering applications for price increases need to be liberalized. The OPA standards now in use may force industries down to profit levels which are unfairly low and which will not provide adequate incentive to enterprise, especially to new enterprise. It seems fair that the minimum earnings standard against which OPA measures applications for price relief be raised on the average by about one-third."

Setting a terminal date now for ending price controls, will, in the committee's opinion, exert an active influence "in working ourselves out of the inflation versus price control dilemma. It can give to the necessary measures of selective decontrol and fiscal-monetary policy a sense of urgency which might otherwise be lacking."

Relative to the need for continuing rent controls for a somewhat longer period than others it is stated: "The acuteness of the housing shortage, the length of time required to relieve it, and the importance of rents in the consumers' budget justify an exception for rents in our general recommendation for the end of all price controls."

On the subject of full use of monetary and fiscal measures to eliminate excessive demand the statement asserts: "The government has a responsibility to supplement and supplant price control by anti-inflation measures which do not restrict the full and free operation of the American productive system. In the transition to free markets we cannot be simultaneously and consistently against inflation and in favor of low taxes, high goverment outlays and unlimited credit expansion. When stable prices and free markets are the objective, strict government economy, steep taxes and monetary restriction are not too high a price," the statement concludes.

Conduit Prices Boosted

Washington

• • • **To increase the** supply of electrical steel ducts urgently needed for the building program, manufacturers of rigid conduit, electrical metallic steel tubing and flexible conduit have been given a price increase of 13 pct over present ceiling prices exclusive of any increases established by individual producers, OPA has announced.

This interim price increase, effective Apr. 23, may be passed on by resellers of these products who will add the same percentage to their prices. These resellers, OPA explained, operate on such a small profit margin that they cannot absorb the increase.

Manufacturers' and resellers' prices for these products were formerly frozen at their Oct. 1, 1941, ceiling price levels.

Steel Product Freight Rate Structure Submitted to ICC

Pittsburgh

• • • **At the public** hearings held by the Interstate Commerce Commission in Buffalo on Apr. 17, concerning freight rates for intercoastal shipment, A. C. Schweitzer, traffic manager of Carnegie-Illinois Steel Corp., and National Tube Co., testified in behalf of the U. S. Steel Corp. recommending a downward adjustment of rates from the Pittsburgh, Youngstown and Cleveland areas to Philadelphia, Baltimore and other East Coast ports for intercoastal shipment to Pacific ports. In addition to his verbal testimony, he offered rate comparisons, differentials, and the present and proposed rate data.

Mr. Schweitzer's testimony was:

"As railroad files will show, as far back as 1921, the subsidiary companies of the U. S. Steel Corp. filed proposals with the carriers for application of the export rates to New York, Philadelphia and Baltimore on intercoastal traffic.

"As pointed out in a letter dated Oct. 19, 1945, other steel producing districts competing with Pittsburgh have enjoyed, for some years, lower rates on iron and steel articles for intercoastal movement than applicable on local traffic.

"This is a proposal to accord to the Pittsburgh, Youngstown and Cleveland districts proper relative rates on intercoastal traffic compared to rates accorded other competing origins and to remove the discrimination which has existed for some time against shipments from these territories on this character of traffic.

"In support and justification of the instant proposal, table I is submitted enumerating examples of existing rates applicable on intercoastal traffic from competing origins to the detriment and injury to the Pittsburgh, Youngstown and Cleveland origins on like traffic. It will be seen that the carriers have already recognized the principle of applying rates to the ports on intercoastal traffic at less than the full local rate to such ports.

"Table II is submitted to show the rail and ocean rate from various competing origins to the Pacific Coast ports as compared with the all rail-rate from these same origins to these same ports and reflects the percentage relationship the rail and ocean rate bears to the all-rail rate. Attention is directed to the fact that the percentage of the all-rail rate from Pittsburgh, Youngstown and Cleveland districts to the Pacific Coast on shipments via rail and ocean, is materially higher than the percentage of the all-rail rate from competing origins.

"In table III there is shown the very conclusive disadvantage in the present freight rate structure against the Pittsburgh, Youngstown and Cleveland districts, in that shipments from New York, Philadelphia and Baltimore territories to the Pacific Coast are accorded very favorable differential over Pittsburgh, Youngstown and Cleveland in the all-rail rates to the Pacific Coast ports. In shipping to the same Pacific Coast ports via rail and ocean, the Pittsburgh, Youngstown and Cleveland districts, under present freight rates, pay the full local rate to the Atlantic ports of New York, Philadelphia and Baltimore. This table shows the percentage of the local rate which shipments from New York, Philadelphia and Baltimore districts pay on all-rail shipments in excess of such all-rail shipments

Table I—Comparison of Rates Applicable on Intercoastal Traffic with Local Rates; Ton Mile and Car Mile Revenue, and Percentage Relationship of Intercoastal vs. Local Rates

Commodity	From	To	Rate Per 100 Lb		Pct Intercoastal Rate is of Local Rate	Short Line Mileage	Revenue Per Ton Mile Intercoastal (Cents)	Revenue Intercoastal	
			Local (Cents)	Intercoastal (Cents)				Per Car (Dollars)	Per Car Mile (Cents)
Iron and Steel Articles	Cincinnati	New Orleans	55	37 Min. 30000	67.3	836	.885	$111.00	13.27
Iron and Steel Articles	E. St. Louis, Ill.	New Orleans	45	36 Min. 30000	80.0	696	1.034	108.00	15.51
Iron and Steel Articles	Chattanooga	New Orleans	47	23 Min. 36000	48.9	498	.923	82.80	16.63
Iron and Steel Articles	Chicago	New Orleans	55	47 Min. 40000	85.5	915	1.027	188.00	20.55
Iron and Steel Articles	Milwaukee	New Orleans	57	50 Min. 40000	87.7	1000	1.000	200.00	20.00
Iron and Steel Articles	Kansas City	New Orleans	58	30 Min. 80000	51.7	863	.695	240.00	27.81
Iron and Steel Articles	Louisville	Mobile, Ala.	55	34 Min. 30000	61.8	652	1.042	102.00	15.64
Iron and Steel Articles	Birmingham	Mobile, Ala.	31	19 Min. 36000	61.3	258	1.472	68.40	26.51
Iron and Steel Articles	Cincinnati	Jacksonville, Fla.	66	37 Min. 30000	56.1	806	.917	111.00	13.77
Iron and Steel Articles	E. St. Louis, Ill.	Jacksonville, Fla.	68	52 Min. 30000	76.5	910	1.142	156.00	17.14
Iron and Steel Articles	Atlanta	Jacksonville, Fla.	36	19 Min. 36000	52.8	331	1.148	68.40	20.66
Iron and Steel Articles	Peoria, Ill.	Jacksonville, Fla.	55	47 Min. 40000	85.5	1026	.916	188.00	18.32
Iron and Steel Articles	Sterling, Ill.	Jacksonville, Fla.	79	52 Min. 40000	65.8	1103	.942	208.00	18.86
Iron and Steel Articles	Milwaukee	Jacksonville, Fla.	81	50 Min. 40000	61.7	1143	.874	200.00	17.50
Iron and Steel Articles	Louisville	Charleston, S. C.	59	37 Min. 30000	62.7	686	1.078	111.00	16.18
Iron and Steel Articles	Decatur, Ala.	Norfolk, Va.	46	33 Min. 36000	71.7	752	.877	118.80	15.80
Iron and Steel Articles	Kansas City, Mo.	Port Arthur	55	30 Min. 80000	54.5	757	.792	240.00	31.70
Springs, elliptic	Detroit	Baltimore	39	36 Min. 60000	92.3	604	1.192	216.00	35.76
Cooperage Stock	Cincinnati	Norfolk, Va.	39	36 Min. 34000	92.3	656	1.097	122.40	18.66
Iron and Steel Articles	Pittsburgh	Albany	37	32 Min. 40000	86.5	473	1.353	128.00	27.06
				(Proposed)	(Proposed)		(Proposed)	(Proposed)	(Proposed)
Iron and Steel Articles	Pittsburgh	Baltimore	30	23 Min. 40000	76.6	313	1.469	92.00	29.39
Iron and Steel Articles	Pittsburgh	Philadelphia	32	24 Min. 40000	75.0	360	1.333	96.00	26.67
Iron and Steel Articles	Pittsburgh	New York	36	27 Min. 40000	75.0	436	1.238	108.00	24.77
Iron and Steel Articles	Youngstown	Baltimore	33	25 Min. 40000	75.7	378	1.322	100.00	26.46
Iron and Steel Articles	Youngstown	Philadelphia	35	26 Min. 40000	74.3	424	1.226	104.00	24.55
Iron and Steel Articles	Youngstown	New York	39	29 Min. 40000	74.4	500	1.160	116.00	23.20
Iron and Steel Articles	Cleveland District	Baltimore	36	27 Min. 40000	75.0	444	1.216	108.00	24.32
Iron and Steel Articles	Cleveland District	Philadelphia	39	29 Min. 40000	74.4	490	1.183	116.00	23.67
Iron and Steel Articles	Cleveland District	New York	41	31 Min. 40000	75.6	562	1.103	124.00	22.06

Table II—Statement of Present and Proposed Intercoastal Compared with All Rail Rates on Iron and Steel Articles To F.O.B. Cars Switching Limits Pacific Coast Ports

FROM	Cleveland and Lorain, Ohio			Youngstown			Pittsburgh			Bethlehem			Sparrows Point		
TO	All Rail	Rail and Ocean	Pct, Rail and Ocean of All Rail	All Rail	Rail and Ocean	Pct, Rail and Ocean of All Rail	All Rail	Rail and Ocean	Pct, Rail and Ocean of All Rail	All Rail	Rail and Ocean	Pct, Rail and Ocean of All Rail	All Rail	Rail and Ocean	Pct, Rail and Ocean of All Rail
San Diego, and Los Angeles Harbor															
Present—Bars, Plates, Shapes, etc.	$1.27	$0.935	73.6	$1.27	$0.905	71.3	$1.27	$0.875	68.9	$1.43	$0.69	48.3	$1.43	$0.591	41.3
Present—Wrought Pipe	1.27	0.965	76.0	1.27	0.935	73.6	1.27	0.905	71.3	1.43	0.72	50.4	1.43	0.621	43.4
Proposed—Bars, Plates, Shapes, etc.	1.27	0.845	66.5	1.27	0.825	65.0	1.27	0.805	63.4	.....	.....	.....	.....	.....	.....
Proposed—Wrought Pipe	1.27	0.875	68.9	1.27	0.855	67.4	1.27	0.835	65.8	.....	.....	.....	.....	.....	.....
San Francisco, Calif.															
Present—Bars, Plates, Shapes, etc.	1.27	0.9395	74.0	1.27	0.9095	71.6	1.27	0.8795	69.2	1.43	0.6945	48.6	1.43	0.5955	41.6
Present—Wrought Pipe	1.27	0.9695	76.3	1.27	0.9395	74.0	1.27	0.9095	71.6	1.43	0.7245	50.7	1.43	0.6255	43.7
Proposed—Bars, Plates, Shapes, etc.	1.27	0.8495	66.9	1.27	0.8295	65.3	1.27	0.8095	63.7	.....	.....	.....	.....	.....	.....
Proposed—Wrought Pipe	1.27	0.8795	69.2	1.27	0.8595	67.7	1.27	0.8395	66.1	.....	.....	.....	.....	.....	.....
Portland, Ore.															
Present—Bars, Plates, Shapes, etc.	1.27	0.949	74.7	1.27	0.919	72.4	1.27	0.889	70.0	1.43	0.704	49.2	1.43	0.605	42.3
Present—Wrought Pipe	1.27	0.979	77.1	1.27	0.949	74.7	1.27	0.919	72.4	1.43	0.734	51.3	1.43	0.635	44.4
Proposed—Bars, Plates, Shapes, etc.	1.27	0.859	67.6	1.27	0.839	66.1	1.27	0.819	64.5	.....	.....	.....	.....	.....	.....
Proposed—Wrought Pipe	1.27	0.889	70.0	1.27	0.869	68.4	1.27	0.849	66.8	.....	.....	.....	.....	.....	.....
Seattle, Wash.															
Present—Bars, Plates, Shapes, etc.	1.27	0.9285	73.1	1.27	0.8985	70.8	1.27	0.8685	68.4	1.43	0.6835	47.8	1.43	0.5845	40.9
Present—Wrought Pipe	1.27	0.9585	75.5	1.27	0.9285	73.1	1.27	0.8985	70.8	1.43	0.7135	49.9	1.43	0.6145	43.0
Proposed—Bars, Plates, Shapes, etc.	1.27	0.8385	66.0	1.27	0.8185	64.4	1.27	0.7985	62.9	.....	.....	.....	.....	.....	.....
Proposed—Wrought Pipe	1.27	0.8685	68.4	1.27	0.8485	66.8	1.27	0.8285	65.2	.....	.....	.....	.....	.....	.....

Rates apply per 100 lb.

from Pittsburgh, Youngstown and Cleveland districts, and also the proposed rates from Pittsburgh, Youngstown and Cleveland districts to the Atlantic ports as compared with the local rates presently applicable on intercoastal traffic.

"In view of the fact that the principle of establishing rates applicable on intercoastal traffic has already been recognized as shown by table I, and also the apparent discrimination against the Pittsburgh district as shown in tables II, and III, it is urged that the carriers promptly correct the situation by according Pittsburgh, Youngstown and Cleveland districts the rates now sought in this proposal."

To Republish Rates For Shipping Scrap

Chicago

• • • **A special rate** on rail shipment of iron and steel scrap from the West Coast to mills in this district received a new lease on life recently by an Interstate Commerce Commission ruling allowing the railroads to republish the rate with the provision that it be limited to scrap for remelting purposes only.

Following violent protests from West Coast steel mills and trade groups, the commission first ordered cancellation of the rate, originally set to become effective Dec. 22, 1945. Cancellation of the rate under I. & S. docket 5378 was ordered to be carried out by May 22. The commission has clarified its order allowing the rate to be republished limiting it to scrap for remelting purposes only.

A suggested rate of $12.32 per gross ton may allow movement of 100,000 tons of surplus shipyard scrap from the Coast to midwestern mills.

Table III—Comparisons of Differentials Per 100 Lb

To Pacific Coast Ports via Rail:

From New York, Philadelphia, Baltimore } $1.43

From Pittsburgh, Youngstown, Cleveland } $1.27 — 0.16¢ Differential

		Local Rate	Pct 0.16¢ Differential is of Local Rate
From New York to	Pittsburgh	36	44.4
	Youngstown	39	41.0
	Cleveland District	41	39.0
Philadelphia to	Pittsburgh	32	50.0
	Youngstown	35	45.7
	Cleveland District	39	41.0
Baltimore to	Pittsburgh	30	53.3
	Youngstown	33	48.5
	Cleveland District	36	44.4

To Pacific Coast Ports via Rail-Ocean:		Local Rate	Proposed Rate	Pct Proposed Rate is of Local Rate
From Pittsburgh to	New York	36	27	75.0
	Philadelphia	32	24	75.0
	Baltimore	30	23	76.6
Youngstown	New York	39	29	74.4
	Philadelphia	35	26	74.3
	Baltimore	33	25	75.7
Cleveland District to	New York	41	31	75.6
	Philadelphia	39	29	74.4
	Baltimore	36	27	75.0

Kirk Declares Machine Tools Be Sold Economically to Stop Inflation

Atlantic City

• • • **Declaring that** machine tools are the key to the prevention of inflation, William P. Kirk, president of the National Machine Tool Builders' Assn., pointed out to the members on the occasion of the association's 44th Semiannual Convention at Atlantic City, Apr. 15 to 17, that selling must now be done on an economic basis. No manufacturer, Mr. Kirk explained, is going to purchase a machine that will increase his manufacturing costs, and it is ridiculous therefore, to assume that any increase in the price of machine tools would be reflected by an increase in the cost of living. The only selling point today, he said, and the only really solid argument that can convince a customer, is the productivity of the machine.

If it will produce goods cheaper and faster than they have been produced before, then there is a sound reason for purchasing it regardless of its cost. But this, he pointed out, tends to lower living costs, increase employment and improve the standard of living. It is no longer sufficient, however, to sell the machine to the shop superintendent; the employee too, must be thoroughly sold, and must be made to see that there is, in effect, a new tool being placed in his hands to enable him to produce more and better work with less physical effort, and that the net result will be to reduce his hours of work and increase his pay.

Commenting on the events of the past 6 months, Mr. Kirk deplored the fact that the long expected, and much talked of high production cycle had not eventuated, and stated that while there was a tendency in some quarters to blame strikes and labor disturbances, the OPA price policy, the national foreign policy, and the general attitude of government, he himself believed that hopes for an immediate postwar boom had been greatly exaggerated. The nation cannot get over a 4 yr war in 6 months, he maintained, and it was his belief that the machine tool industry actually had come through the past half year in much better shape than expected. Surplus machines still continue to befog the market, and the sales to date have been disappointingly small. There are, however, signs that the Army and Navy may in the near future, adopt the association's plan of maintaining a substantial reserve of equipment, and this would serve to reduce the overburden of surplus by a healthy amount.

By far the best attended convention in many years, members from all parts of the country were present. A lively interest was expressed in the interesting talks presented by various members, all of whom were in accord that there was no longer any necessity for price control on machine tools. It was pointed out that a 20 pct increase has been granted on some specific items, and there are indications that the same relief might be granted in the near future on all tools.

Weir Predicts Steel Production Stopped Within Three Weeks

Detroit

• • • **Steel production** this week will fall to about half the total tonnage capacity of the industry, and will plummet even lower next week, it was predicted here in a press conference by Ernest T. Weir, chairman of National Steel Corp.

Mr. Weir anticipated that within the next three weeks or so no steel whatsoever will be made in the country as a result of the coal strike. He expressed pessimism over the industrial outlook for the months immediately ahead, saying that during the first quarter the steel industry lost 10 million of a possible 17 million tons of capacity, and would lose more than 17 million tons during the first half of the year.

Answering a question as to what the industry would do if all OPA controls were removed, Mr. Weir stated he believed that only a small average advance would be made. However, he said that all hot-rolled items, particularly forging bars, had been priced most unsatisfactorily in the recent OPA adjustments.

Mr. Weir's remarks came before an address delivered to the Detroit Section of the Society of Automotive Engineers, at which he declared that the nation was drifting toward a socialistic form of government, and that it was incumbent on every citizen opposed to such a tendency to make known his opposition.

During his speech he discussed the recent negotiations between the steel union and management, as represented by Benjamin Fairless of U. S. Steel Corp. He said: "As a result, the settlement—if it can properly be called a settlement—for the entire steel industry was made by agreement between the Administration, the CIO, and the United States Steel Corp., and consequently every steel company, regardless of size or commercial or competitive conditions, must absorb the same labor cost as the industry's biggest and richest company. Hundreds of companies were involved by this decision. Not one of them had the opportunity to state a position or express a viewpoint. . . . If this is to be the future pattern of wage settlements, there is no future for small business in any branch of industry in the United States."

Steel Exports Under Cloud

Washington

• • • **Plans for steel** exports under export (CXOS) symbols are still very much up in the air. Opposition to granting CPA authorization for export steel for the remainder of the year has sprung up due to heavy domestic demands. It is possible that the whole export program may be put off until 1947 other than orders placed on the open market by foreign buyers.

As an example it was pointed out that Henry Kaiser is producing steel for export but not under CPA direction.

The prospective six months' allocation has already been cut to 628,000 tons exclusive of 154,000 tons of tin plate which has been previously ordered. Should this allocation remain in effect at the end of the coal strike, it is likely that shipments will not begin to move until the third and fourth quarters. Talk of second quarter shipments has been labeled as so much "bunk" by responsible officials here.

Free Prices for Machine Tools Expected to Be Announced on May 8

By KARL RANNELLS

Washington

• • • **The bulk of machine** tools and equipment will have been removed from pricing restrictions before the middle of May under decontrol plans now being completed by OPA, according to dependable sources. In addition, the pricing agency is scheduling other actions which will remove price control from virtually all capital and producers' goods within 60 days.

Nearly all machine tools and equipment still under ceilings will be included in another decontrol order which will supplement and be equally as broad in scope as the action of Apr. 8. The new order is being prepared by OPA for announcement early next month, probably around May 8, to become effective five days later.

It was originally intended that a larger number of machine tools and equipment items be covered in the April action but the general nature of the order limited its application to from 5 to 10 pct of the total, mainly those in the less important categories.

In view of the wide scope of the forthcoming action no further decontrol actions will be taken on individual or separate classes of machine tools until after the new order is made effective.

Decontrol took a noticeable upward swing during April, with OPA activity currently three times greater than during any former period. Some of the adjustments have been forced by the production needs of the moment and others were mandatory under the wage-price policy. Some apparently were brought about by the necessity of giving way on small issues in order to hold fast on major ones.

All these adjustments and decontrol actions have been coming at shorter intervals and with greater regularity. The April action brought about the amount of industrial equipment released from control up to 20 to 35 pct—depending upon definitions and the base period used for the estimate. While industry was far from satisfied with the extent of the action, most of its representatives here say that it does provide a sound working basis for expansion of future decontrol actions.

All this is indicative of a revolution in OPA thinking and operation which is seen as having been quietly taking place in top levels of the agency. Some of those in higher places are gradually inclining to the view that only a brief flurry of price increases in many fields would result.

Representative of the new and realistic line of thinking is the scheduled action for further decontrol of industrial equipment. The new attitude is that decontrol of machine tools and related equipment would bring little or no increase beyond the new ceilings allowed to compensate for increased costs. Agency officials are leaning to the belief that big buyers of industrial equipment and related products are in a strong bargaining position from which they could and would feel out competition before accepting an unjustified quotation for heavy goods they were buying.

However, this change-over to a realistic viewpoint has been slow in seeping through from the top to the lower levels of authority. There the continuation of governmental power and authority still appears to be paramount in importance.

The first reaction in some quarters to OPA's increased decontrol activities was that it was a smoke screen designated to placate opposition in Congress to an unrestricted extension of the agency for another year. OPA's own modest assertion that its Apr. 8 order was the "most extensive decontrol action" taken—a self-evident fact—did little to dispel this belief.

On the other hand a greater number believe that decontrol actions may have been hampered by the fact that OPA extension has been under consideration and that wiser heads may have put a brake on some actions in an effort to avoid creating the impression that it was putting on a show.

In any case, these reactions lost their force because of the thorough drubbing given the OPA by the House. Not only did it vote to extend the price control act for only nine months instead of one year as requested by the Administration, it also emasculated the measure to such a wide degree that OPA and other officials screamed that if enacted as passed by the House, OPA would be destroyed. Obviously the White House would exercise its veto power to prevent enactment in such a form as it now stands. Meanwhile Administration supporters are seeking desperately to have the Senate whip the bill back into a likeness much more similar to the present act than in the form in which the House left it. While the Senate ordinarily is more tractable than the House in going along with the Administration, it too is often rambunctious. Realizing this, Administration forces are much concerned lest the Senate will do little to strengthen the House bill. That, in the Administration view, would mean that price control after the present act expires on June 30 will be a wreck.

Screw Machine Prices Up

Washington

• • • **Manufacturers of** screw machine products, have been given increase factors, OPA has announced. Screw machine products were given a 13.6 pct increase over their March, 1942 prices. At the same time, services performed on screw machine products were granted a 10 pct increase over March, 1942 prices.

This double action was necessary, OPA said, because many screw machine products are fabricated from material owned by another. Such services are subject to the commodities and services regulation (Maximum Price Regulation 581) and the increase factor therefore does not reflect material increases.

The increase applicable to screw machine products covered by revised MPR 136, effective Apr. 19, applies to all sales, and replaces the 8 pct increase given these producers on Sept. 19, 1945. This previous increase was applicable only to list and established prices. Before Sept. 19, 1945, prices of all screw machine products were frozen.

Britain Would Increase German Steelmaking Capacity

Berlin

By JACK R. HIGHT

o o o

• • • **Despite the Four-Power** announcement of agreement on the future level of German industry with steel output at the drastic 5.8 million tons annual figure, British authorities continue to hope that some modification of this decision can be reached. The only variation from the 2-month old agreement on steel to be found on the official surface here today is the statement by "a ranking British staff officer" that at least 7.5 million tons are certain to be needed for a recovering Germany before 1949.

The fundamental step for the establishment of levels of operation for all German industries was the decision that the standard of living in the fatherland would be permitted to recover from the present emergency level to approximately the 1932 standard of living. This will represent a reduction of approximately 30 pct in the German prewar standard of living.

In manufacturing and mining fields it is estimated that sufficient capacity will be left in Germany to produce at a rate of 50 to 55 pct of the 1938 level. The announced level for steel output to be permitted at present represents 30.2 pct of the 1936 rate. If after review by the Allied Control Authority, Germany were permitted to raise this output to 7.5 million tons per year, this would represent 39 pct of the 1936 output.

The plan as announced is based within the outlines as laid down at Potsdam last year, and does not attempt to modify the Berlin Protocol. British and American sources are now pointing out carefully that the partitioning of Germany into four economic entities as detailed at Potsdam was a temporary expedient, and that they are now looking forward to setting up a unified control of Germany. If the centralized political administration is not realized with the subsequent development of a single economic unit, the level of industry plan now revealed must be overhauled. The carefully worked out balance of exports and imports that is to make Germany able to pay for its food will not permit the separation of the Ruhr or even the Saar from the economic pattern of Germany.

The establishment of the future levels of industry will permit the Four-Power government in Berlin to proceed with the detailed planning of the reparations gravy with which the Europeans present are so preoccupied. This work, which had been delayed until the final decision as to the extent of the stripping had been made, will probably require about six weeks more of work.

When that work is complete it will be possible to inform the German people how much of their economy is to be left, and where to go to find it. This is the work that was originally scheduled to be completed by Feb. 2.

At present there is no centralized idea anywhere of just what has been unilaterally removed from Germany as reparations, and what German industry is once more in operation. British authorities who are occupying the bulk of Germany's heavy industrial capacity, are being particularly cagey about disclosing what factories are at work.

Using strictly British statistics

(CONTINUED ON PAGE 160)

TABLE I—Level of German Industry

PROHIBITED INDUSTRIES

(1) a—War Materials as specifically defined by the Allied Control Authority including but not limited to arms, ammunition and implements of war, as well as all types of aircraft and specific war chemicals and gases.
b—Sea-going ships (not interpreted to include small fishing vessels).
c—Magnesium.
d—Primary aluminum and alumina for the purpose of producing aluminum.
e—Beryllium.
f—Vanadium produced from Thomas slags.
g—Radioactive materials.
h—Hydrogen peroxide above 50 pct strength.
i—Radio transmitting equipment.
j—Heavy tractors above the limits of capacity determined by the Allied Control Authority.
k—Heavy machine tools of the sizes and types prohibited by the Allied Control Authority.

(2) Production of the following items will be permitted only until sufficient imports will be possible and can be paid for:
a—Synthetic gasoline and oil.
b—Synthetic rubber.
c—Ball and taper roller bearings.

(3) Production of synthetic ammonia will be permitted until exports can be found to pay for required imports of nitrogen as well as for all other necessary imports. To the extent to which synthetic ammonia production is not eliminated, it will be limited to not more than that amount necessary to meet Germany's peacetime requirements.

TABLE II—Level of German Industry

Industries the levels of which are determined or estimated for 1949
Industries from which production capacity will be taken for reparations

Serial	Item	Production or Supply in 1936 Metric Tons	Estimated Level in 1949 Metric Tons	Pct of 1936 Level	Remarks
(1)	Steel	19.2 million	7.5 million capacity	39	Permitted level of industry subject to annual review.
(2)	Copper	292,000	140,000	48	(a) Figures for nonferrous metals are for consumption including consumption for exports containing these metals. (b) It is estimated that in 1949, 40,000 tons of copper, 20,000 tons of lead and 45,000 tons of zinc will be used in the manufacture of exports containing these metals. (c) Figures for nonferrous metals include secondary metal and scrap. (d) Estimated that to meet the requirement of 8,000 tons of tin it will be necessary to import 6,000 tons of tin.
(3)	Zinc	225,000	135,000	60	
(4)	Lead	223,000	120,000	54	
(5)	Tin	16,000	8,000	50	
(6)	Nickel	9,500	1,750	18	
(7)	Aluminum (consumption)	.....	30,000	..	
(8)	Magnesium (consumption)	.....	1,000	..	

Weekly Gallup Polls . . .

Public Favors Law to Prohibit Utility Strikes

Princeton, N. J.

• • • **The American public** would give overwhelming support to a law designed to forbid all strikes in public service industries such as electric, gas, telephone, and local transportation companies, according to George Gallup, director, American Institute of Public Opinion.

In at least one state, New Jersey, legislators have already passed a law to control strikes in utilities. In fact, the law was recently put into use by Governor Walter E. Edge, when he seized struck gas and coke plants of the Public Service Electric & Gas Co. and kept them running until agreement was reached.

A majority of union members included in the questioning are found opposed to strike-forbidding legislation for utilities. Four in every ten favor the legislation, however, the poll reveals.

A majority of both Republicans and Democrats favor such legislation, although the approving majority is much larger among Republicans than Democrats.

The question used to measure sentiment on the issue:

"Should laws be passed to forbid all strikes in public service industries such as electric, gas, telephone, and local transportation companies?"

The replies:

Entire Nation

	Pct
Approve law to forbid utility strikes	60
Disapprove	32
Undecided	8

Union Members

Approve law to forbid utility strikes	40
Disapprove	52
Undecided	8

Vote by Politics

	Democrats Pct	Republicans Pct
Approve law to forbid utility strikes	57	71
Disapprove	35	24
Undecided	8	5

The institute has found the public heavily in favor of having Congress do something at this time about strikes in general.

The public's ideas on how to cure strikes is, surveys find, markedly on the side of curbing labor unions rather than management.

A large majority were found in favor of the original Truman proposal calling for a cooling-off period and fact-finding boards, although sentiment on the issue among leaders in both management and labor became widely split on the proposal.

•

• • • **If Rep. Carroll Reece** of Tennessee, the new Republican National Chairman, were to tour the country talking to the rank and file of Republican voters who numbered more than 22,000,000 in the last election, what would he find out about their views on the major political issues?

How do Republican voters, as distinguished from Republican leaders, regard OPA, draft extension, minimum wage legislation, the UN, strikes, and similar matters?

In recent weeks the institute, in its coast to coast polls, has sounded the views of thousands of Republican — and Democratic — voters on these and other vital issues.

The results show that, as some critics of our present two party system have been arguing for years, the views of Republicans are not substantially different from those of Democrats on many major issues.

Republicans support the Administration's policies on six of the eight questions covered in the survey—at least as far as fundamental broad policy is concerned. In the case of the remaining two, in which the majority of Republicans are found critical of the Administration's point of view, the Democrats are also found disagreeing with official party policy.

This highlights one major problem confronting Chairman Reece and other Republican leaders, namely, that a number of the big issues on which they might want

Republicans Support Same Administration Policies As Do Democrats, Polls Show

o o o

to take a stand opposite from the Democrats are issues on which Republican sentiment is in agreement with Democratic sentiment. The major quarrel that Republican voters have with Democrats is not over ends, but means to those ends. The problem of the GOP is how to criticize effectively the means used by the Democrats to achieve popular goals while at the same time avoiding giving the impression that the party is opposed to the goals.

The Republican attitude on some major issues is shown below:

OPA—Continuation of OPA is favored by a very substantial majority of GOP voters, whose views on the matter do not differ greatly from Democratic voters. The Republican vote in a recent institute poll on OPA continuation was: favor, 68 pct; opposed, 28 pct; no opinion, 4 pct.

Minimum Wage — Republican voters are almost as much in favor of the 65¢ minimum wage as the rest of the country. A poll taken just before Congress passed the 65¢ measure found about six out of every ten GOP voters approving.

Strikes—During the war Republican voters were generally more in favor of laws to curb strikes than Democratic voters, although sentiment was overwhelming in both groups for such action. At present nearly eight in every ten Republicans (79 pct) think Congress should do something about the strike situation, and the principal suggestions offered involve disciplinary action against unions.

Armed Forces Merger—Of the three out of four Republicans who were found able to tell field reporters what the term "unified command" means, the majority

(CONTINUED ON PAGE 169)

Prefabrication Gains Ground in Industrial Field

By CHARLES T. POST

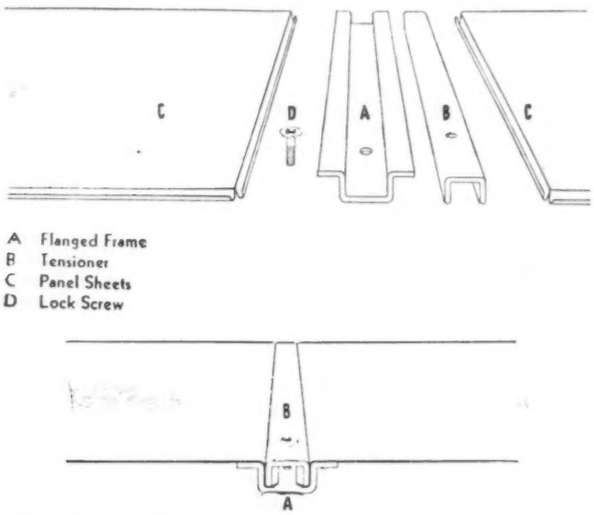
Chicago

• • • **Prefabrication,** just out of diapers in the building field, is graduating into long pants in industry with far less publicity.

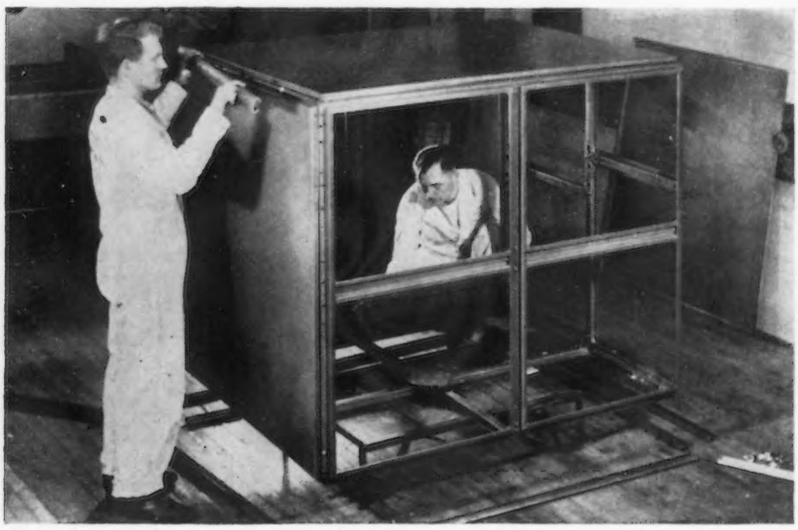
Standardized steel or aluminum components, precision designed for simple field assembly into lightweight skin stressed structures found their biggest outlet in truck bodies before the war. Today the Lindsay Corp., pioneer in the truck body field, is capitalizing on war experience with this type of construction to use it for equipment housings, industrial refrigerator cabinets, shipping containers for air cargo, crane cabs, chutes, trailer bodies, expanded metal guard rails, ovens, portable partitions, and even buildings.

The patented Lindsay structural method is built around four basic standardized components fabricated at its Chicago plant to close specifications for any given application. Shipped knocked down, the components are assembled at the manufacturing point of the end product.

See THE IRON AGE, *Mar.* 21, 1940, *for first mention of Lindsay structural members.*



BASIC COMPONENTS: *Basic parts of the Lindsay structural method are the flanged frame, tensioners, panel sheets and lock screws. The flanged frame including the compression members is erected and the sheets put into place. Then the U-shaped tensioner member is screwed on to the frame gripping the curved edges of the sheet and pulling it into tension.*



Although varying in dimensions, the basic parts are the flanged frame, tensioners, panel sheets and lock screws. First the flanged frame, including compression members is erected and the sheets put in place. Then the U-shaped tensioner member is screwed onto the frame, gripping the curved edges of the sheet and pulling it into tension. The amount of tension varies with the application, but the load is carried by the sheets.

Considerable flexibility is provided in choice of materials. Framing sections are usually formed from 0.125 in. and fittings from 16 gage hot-rolled pickled and oiled strip, with cold-rolled sometimes used. Curved corner panels are 20 gage and flat panels 24 or 26 gage galvanized or otherwise coated sheets. The structural method is equally suited to aluminum, with 0.020 and 0.025 in. 61 ST panels used for industrial applications and 0.030 in. for transport applications. Some structures recently have been built with 24 ST aluminum sheets secured from aircraft surplus.

Lindsay structures depart from conventional design in that the frame members are not load carrying. This makes it possible to use light cold-formed framing members reducing frame weight to a minimum. Transfer of the load carrying function to the pre-stressed skin thus provides a high strength-weight ratio for the finished structure.

Standardization of design, providing uniformity of finished structures even though assembled in different plants, gained favor with operators of national truck fleets, such as the big meat packing companies. This eliminated the former practice of having bodies built at a single plant and shipped to point of use. The ease of repairing damaged bodies by replacing only the affected panels also found favor with truck and trailer operators.

When the commercial truck body business dried up during the war Lindsay found new outlets with the armed forces which foreshadowed

industrial uses now being developed. The conservation of steel, through use of dierolled, diedrawn and diecut parts, proved a talking point during the early days of the steel shortage. The same arguments the company had used in the trucking field soon brought big orders from the Canadian government for bodies for ambulances, mobile work shops, overseas field offices, refrigerators and stores followed, taxing the plant's capacity. When the armies began to move overseas, prefabrication really hit its stride. The need for structures which could be shipped knocked down to conserve shipping space, erected by inexperienced personnel without special equipment, and knocked down again for reassembly as the bases moved forward brought orders for widely varying types of units. It proved especially suited to refrigerated storehouses where precise construction was a factor. The Navy found use for deck refrigerators, and heating and ventilating unit housings.

Ease of accessibility and demountability have proved important for this type of structure in the industrial field, where equipment housings, ovens, inspection booths, partitions, and guard railings place emphasis on these factors. A recent application involves a mass popcorn machine.

Strangely enough, the application for which this structural method was designed, railroad refrigerator cars, never has been commercially used in this country although some car bodies have been made for export. The most recently developed field is the one in which most prefabrication methods make their original bid—prefabricated homes. Pilot models have been erected by a Lindsay representative and probably will go into production late this year.

Coastwise the prefabricated units are competitive with conventional welded or bolted construction on a mass production basis for most of the uses for which the structures have been adapted.

New Plant for Ceco Steel

Chicago

• • • **Ceco Steel** Products Corp. plans to erect a plant at Houston, for fabrication of reinforcing steel, steel forms, and steel joists.

McKee Co. Elects Widdell President At Annual Meeting

Cleveland

• • • **H. E. Widdell** was elected president of Arthur G. McKee & Co. at the annual meeting of the board of directors of the company, Apr. 16. No other changes of officers were made, and all directors of the company were re-elected at the annual stockholders' meeting which was held prior to the organization meeting.

Mr. McKee will continue to participate in the affairs of the company as chairman of the advisory committee of the board of directors, the other members of this committee being Mr. Widdell, the new president, and Robert E. Baker, secretary-treasurer, one of the original partners of the McKee organization.

Mr. Widdell's first connection with Arthur G. McKee & Co. was in 1925. At that time, Arthur G. McKee & Co., seeking to enter the petroleum refining field, became associated with The Widdell Engineering Co., a company prominent in the design and construction of petroleum refining plants, of which Mr. Widdell was the principal owner. Several years later, Widdell Engineering Co. was absorbed by Arthur G. McKee & Co., and since then Mr. Widdell has been a director and a vice-president of the McKee Co.

Mr. McKee has been head of the McKee organization for more than 40 yr. The business was established by Mr. McKee in 1905 when, as a consulting and contracting engineer, he opened an office in Cleveland to serve the iron and steel industry. From that beginning, the scope of the activities of the McKee Co. has grown to embrace the complete design and construction of all kinds of iron, steel and petroleum refining plants, and the company is now one of the leading engineering and construction companies both in this country and in foreign countries in the fields which it serves.

Coming Events

Apr. 28-May 2 **American Ceramic Society**, annual meeting, Buffalo.

Apr. 29-30 **National Welding Supply Assn.**, bi-annual convention, Dayton.

Apr. 30 **Traffic Club of Pittsburgh**, annual dinner, Pittsburgh.

May 6-7 **Assn. Iron & Steel Engineers**, spring conference, Chicago.

May 6-10 **American Foundrymen's Assn.**, golden jubilee convention and exposition, Cleveland.

May 23 **American Iron & Steel Institute**, general meeting, New York.

May 29-31 **Machinery Dealers National Assn.**, Atlantic City, N. J.

June 2-7 **Society of Automotive Engineers**, summer meeting, French Lick, Ind.

June 3-5 **American Gear Manufacturers Assn.**, annual meeting, The Homestead, Hot Springs, Va.

June 13 **Metal Powder Assn.**, spring meeting, New York.

June 17 **American Society of Mechanical Engineers**, machine design group, first session, Detroit.

June 17-18 **American By-Product Coke Institute**, first annual meeting, Seaview Country Club, Absecon, N. J.

June 17-20 **American Electroplaters Society**, annual convention, Pittsburgh.

June 24-28 **American Society for Testing Materials**, annual meeting, Buffalo.

Sept. 10-14 **American Chemical Society**, exposition, Chicago.

Sept. 11-12 **Society of Automotive Engineers**, national tractor meeting, Milwaukee.

AISI Engineer Cites Lack of Realism In City Building Codes

Chicago

• • • **Building codes** in most American cities are outmoded and should be changed to permit more realistic dealing with fire hazards, B. L. Wood, of New York, consulting engineer of the American Iron & Steel Institute, told the Western Society of Engineers at its recent meeting in Chicago.

Half the city codes are over 15 yr old, he said, and one out of four is over 20 yr old. These outmoded codes fail to take advantage of economy and safety factors provided by new building techniques.

"The science of fire protection and building regulation must keep step with the progress made by the building industry, to reduce the already serious annual losses from fire," Mr. Wood said.

"Most cities permit building a gas service station with four brick piers, glass show windows between them and interior unprotected wood-joist construction; but they will not allow the station to be built of steel, concrete and other non-combustible materials, unless the steel is fire-protected. The building official often recognizes the superior fire-safety afforded by the latter type of structure, but the code neglected to provide for its use.

"Requirements governing protection of openings in walls are inadequately treated in many building codes. New types of finishing materials, some easily ignitable, have already proven fatal in fires. Their introduction in recent years has created a need for more careful and rational regulation. We are required to build heavy masonry exterior walls for protection where only a low degree of fire hazard exists. But building codes permit glass openings in these walls, without limit or size. Even fire windows, bearing the Underwriters' label, are capable of withstanding only 45 min of the standard fire test. Beyond that exposure the glass melts.

High labor and material costs threaten to retard much-needed building construction, the speaker said. Only through development and adaptation of new materials, methods and techniques will it be possible to offset these increased costs. For uniformity of safety, only ratings established in accordance with the standard American Society for Testing Materials fire-test procedure should be adopted in building codes.

WAA Approves New List Of Surplus Tool Dealers

Washington

• • • **From Mar. 16 to 31,** inclusive, a total of 238 more "approved dealers" were licensed to solicit and negotiate sales of government-owned surplus machine tools and production equipment under the agency-dealer plan for such surplus property, the War Assets Administration has announced. This brings "approved dealers" signed under the government program to a total of 1574 as of Mar. 31.

In addition, another 119 dealer appointments were reported made by 33 WAA regional offices, but these approvals, pending signature and acceptance of contracts, have not as yet been forwarded to the Agency-Dealer Section, WAA, at Washington. In addition to dealers approved, the WAA field office had on hand as of Mar. 31, a total of 312 applications in process of screening and approval.

As of Mar. 23, these "approved dealers" had sold a total of $23,557,909 (cost to U. S.) of surplus machine tools and certain other production equipment. The government's recovery on these sales was $11,822,681, less "approved dealer" commissions. Through Mar. 15, total disposals of surplus machine tools sold direct, including sales made by "approved dealers," amounted to $145,808,371. Recovery on these sales was $78,719,670.

Aluminum Price Drop

London

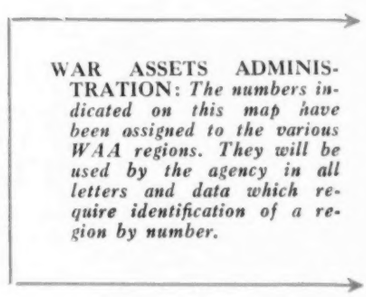
• • • **The delivery price** of virgin aluminum to British works has been reduced from £85 per long ton—15.31¢ per lb at current exchange rate of 4.03½¢, to £67—12.07¢ per lb, due to the Ministry of Supply contract to buy 215,000 metric tons from Canada in 1946 and 1947. The new price applies to metal of 99 to 99½ pct purity with premiums for higher purity.

Appoints WAA Regional Administrative Heads

Washington

• • • **As a possible help** to those who will come into contact with the War Assets Administration the addresses of the regional directors of the WAA appointed Mar. 8 are as follows:

H. L. KENNON, 699 Ponce de Leon Ave., NE, Atlanta.
McCLELLAN RATCHFORD, Comer Bldg., Birmingham.
JOHN MILLAN, 10 P. O. Square, Boston.
J. K. WILSON, 317 South Tryon St., Charlotte, N. C.
F. A. McLAUCHLAN, 209 S LaSalle St., Chicago.
ROWLAND D. SCHELL, 704 Race St., Cincinnati.
FLOYD E. BRICKEL, Federal Reserve Bank Bldg., Cleveland.
A. G. ELMENDORF, Cotton Exchange Bldg., Dallas.
JOHN A. SKEEN, 728 15th St., Denver.
HENRY F. ECKFELD, 800 Griswold Bldg., 1214 Griswold St., Detroit.
HAMILTON MORTON, P. O. Box 1407, Fort Worth, Tex.
VERNON M. POMEROY, Power Block, P. O. Box 177, Helena, Mont.


WAR ASSETS ADMINISTRATION: The numbers indicated on this map have been assigned to the various WAA regions. They will be used by the agency in all letters and data which require identification of a region by number.

ALBERT E. REGESTER, Rusk Bldg., Houston, Tex.
WILLIAM J. WARREN, Western Union Bldg., Jacksonville, Fla.
JOHN E. KIRCHNER, Troost Ave. & Bannister Road, P. O. Box 1307, Kansas City.
SERGE F. BALLIF, Pacific Mutual Bldg., Los Angeles.
CHARLES C. CHRISTIAN, Pyramid Bldg., Little Rock, Ark.
R. M. BOTTOMLEY, Lincoln Bank Bldg., 421 W. Market St., Louisville.
ARTHUR W. CARLSON, McKnight Bldg., Minneapolis.
H. W. McMENAWAY, Nashville Trust Bldg., Nashville, Tenn.
LEONARD E. BARNES, Richards Bldg., 827 Gravier St., New Orleans.
FRANK L. SEYMOUR, 350 Fifth Ave., 62nd Fl, New York.
R. D. WILBOR, JR., Cotton Exchange Bldg., Oklahoma City 2, Okla.
GORDON T. BURKE, WOW Bldg., Omaha, Neb.
GEORGE L. EVANS, Lincoln-Liberty Bldg., Philadelphia.
M. T. MUDGE, Pittock Block, Portland, Ore.
A. H. GRAHAM, Mutual Assurance Society Bldg., 909 East Main St., Richmond 19, Va.
CHARLES G. ALEXANDER, Victoria Bldg., 407 N Eighth St., St. Louis.
W. J. WALTHALL, Transit Tower, San Antonio, Tex.
JOSEPH S. WILLES, Dooly Bldg., Salt Lake City.
LELAND C. DEDO, 30 Van Ness Ave., San Francisco.
O. C. BRADEEN, 2005 Fifth Ave., Seattle.
JAMES G. WILCOX, Columbia Bldg., Spokane.

SEATTLE 11
SPOKANE 31
PORTLAND 32
OREGON
MONTANA
29 HELENA
NORTH DAKOTA
SOUTH DAKOTA
MINNEAPOLIS 21
WISCONSIN
NATIONAL AUTO PARTS OFFICE 34
DETROIT 16
NEW YORK
MAINE
VT.
N.H.
MASS.
CONN.
1 BOSTON
2 NEW YORK
PENNSYLVANIA
PHILADELPHIA 3
N.J.
MD.
DEL.
WYOMING
NEBRASKA
OMAHA 24
IOWA
CHICAGO 5
ILLINOIS
15 CLEVELAND
OHIO
CINCINNATI 4
W. VA.
RICHMOND 12
VIRGINIA
30 SALT LAKE CITY
UTAH
NEVADA
10 SAN FRANCISCO
9 DENVER
COLORADO
KANSAS CITY 8
KANSAS
MISSOURI
22 ST. LOUIS
17 LOUISVILLE
KY.
TENNESSEE
18 NASHVILLE
NORTH CAROLINA
13 CHARLOTTE
SOUTH CAROLINA
33 LOS ANGELES
ARIZONA
NEW MEXICO
OKLAHOMA
25 OKLAHOMA CITY
ARKANSAS
23 LITTLE ROCK
BIRMINGHAM 19
ALABAMA
6 ATLANTA
GEORGIA
(DALLAS)
FT. WORTH 7
26 DALLAS
TEXAS
MISSISSIPPI
LOUISIANA
FLORIDA
14 JACKSONVILLE
HOUSTON 27
20 NEW ORLEANS
SAN ANTONIO 28
STATISTICS AND PROGRESS REPORTING DIVISION
WAR ASSETS ADMINISTRATION 3-28-46

Construction Steel...

New York

• • • **Fabricated steel awards** this week included the following:

4000 Tons, Gary, Ind., rebuild blast furnace No. 6, Gary Works, Carnegie-Illinois Steel Corp., to John Mohr & Sons.

2500 Tons, Los Angeles, Los Angeles Times building, through P. J. Walker, to Consolidated Steel Corp.

1400 Tons, New York, apartment house, 300 E. 57th, Inc., to American Bridge Co., Pittsburgh.

1000 Tons, Los Angeles, wire mill building, Bethlehem Pacific Coast Steel Corp., to Bethlehem Pacific Coast Steel Corp., San Francisco.

850 Tons, Enfield, Me., Penobscot bridge to American Bridge Co., Pittsburgh.

560 Tons, Various Locations, 1946 bridge requirements, Rock Island RR, to American Bridge Co., Pittsburgh.

525 Tons, Whitney Pt., N. Y., bridge RC-46-3, through Howess & Farrel, Inc., to American Bridge Co., Pittsburgh.

500 Tons, Findlay, Ohio, manufacturing building, National Automotive Fibres Co., to R. C. Mahon Co., Detroit.

460 Tons, Lompoc, Calif., Johns-Manville Co. factory addition, through Robt. E. McKee, to Pacific Iron & Steel Co.

400 Tons, Chicago, warehouse and train shed, Goldblatt Bros., Inc., to American Bridge Co., Pittsburgh.

370 Tons, Vienna, Md., addition to power plant for Eastern Shore Public Service Co., United Engineers & Constructors, to Dietrich Bros.

250 to 350 Tons, Crestview, Fla., hangar, U. S. Engineers to Virginia Bridge Co., Roanoke, Va.

335 Tons, Cherokee, Iowa, Illinois Central System railroad bridge to American Bridge Co., Pittsburgh.

300 Tons, Odair, Wash., face caissons for maintenance of spillways, Grand Coulee Dam, to Consolidated Steel Corp., Los Angeles.

300 Tons, Philadelphia, Provident Trust Co., to Phoenix Bridge Co., Phoenixville, Pa.

180 Tons, Reading, Pa., Carpenter Steel Co., laboratory, to Reading Metalcraft Co.

150 Tons, Los Angeles, building extension to open hearth furnaces, Bethlehem Pacific Coast Steel Corp., to Bethlehem Pacific Coast Steel Corp., San Francisco.

100 Tons, Malden, Mass., telephone exchange, to Ingles Iron Works through J. F. Fitzgerald Construction Co., Boston contractor.

• • • **Fabricated steel inquiries** this week included the following:

12,000 Tons, New York, 1407 Broadway Corp., building.

9000 Tons, Boston, John Hancock Insurance Co., building.

4000 Tons, East Chicago, Ind., gas storage container, Public Service Co. of Northern Illinois.

3400 Tons, Acme, N. C., Riegel Paper Co., building.

1700 Tons, Iowa, North Western RR, bridge superstructure.

1500 Tons, Grasselli, N. J., building for General Analine Co.

1000 Tons, Princeton, N. J., Firestone Memorial Library.

900 Tons, Fayetteville, Ill., state highway bridge.

900 Tons, Tipton, Iowa, bridge.

870 Tons, Essex County, N. J., two bridges on Route 25, rebid by New Jersey Highway Dept., bids due Apr. 26.

800 Tons, La Grange, Ill., Electro-Motive Div., engineering building.

600 Tons, Scranton, Pa., warehouse and manufacturing building for International Textbook Co., bids due Apr. 25.

550 Tons, Ashwaubenon, Wis., Joannes Bros. Co., warehouse.

500 Tons, Detroit, Cycle-Weld Co., factory.

400 Tons, Phoenix, Ariz., Gold Water department store, Dell Webb, general contractor.

300 Tons, Columbus, Ohio, engine house for Pennsylvania RR.

300 Tons, Chicago, addition to Pettibone-Mulliken Corp., foundry.

275 Tons, Lackawanna County, Pa., two bridges rebid by Pennsylvania Highway Dept., bids due Apr. 29.

250 Tons, Amityville, N. Y., factory building for Keller Dorian Corp.

250 Tons, Morris, Ill., Public Service Co. of Northern Illinois, holder.

248 Tons, Columbia Falls, Mont., Spec. 1249, steel warehouse at Hungry Horse Dam, Bureau of Reclamation, Denver; American Bridge Co. only bidder.

230 Tons, Chicago, Damen Ave. Shops, General American Transportation Corp.

226 Tons, Webster City, Iowa, Illinois Central System, bridge.

200 Tons, Topaz, Idaho, state highway overpass.

200 Tons, Cartersville, Ga., power house, bids to U. S. Engineers.

200 Tons, Indianapolis, Pennsylvania RR, viaduct.

135 Tons, Friant, Calif., two 30-ton gantry cranes for Friant Dam, Spec. 1227, Bureau of Reclamation, Denver; Cyclops Iron Works, San Francisco, low bidder.

100 Tons, Westchester, Pa., building for Schramm, Inc.

100 Tons, Bluffton, Iowa, power station.

• • • **Reinforcing bar** awards this week included the following:

2100 Tons, Chicago, R. R. Donnelley & Sons Co., printing plant, to Olney J. Dean Steel Co., Chicago.

1200 Tons, Louisville, Ky., Courier-Journal building, to American Builders Supply Co.

900 Tons, Los Angeles, Rexall Drug Co. building, through Louis C. Dunn Co., to Judson Pacific Murphy Corp.

750 Tons, Plymouth, Wis., Borden Co., plant to Ceco Steel Products Corp., Chicago, through W. W. Oeflein, Inc., contractor, Milwaukee.

512 Tons, Los Angeles, Terminal Island Freeway overhead crossing over Union Pacific RR tracks, through Macco Construction Co., to Bethlehem Pacific Coast Steel Corp.

500 Tons, Brecksville, Ohio, B. F. Goodrich Co., industrial building, to Carnegie-Illinois Steel Corp., Pittsburgh.

375 Tons, Louisville, Ky., state highway work, to American Bridge Co., Pittsburgh.

350 Tons, Ottumwa, Iowa, reservoir, to Carnegie-Illinois Steel Corp., Pittsburgh.

300 Tons, Louisville, Ky., Belknap Hardware Mfg. Co., building, to American Bridge Co., Pittsburgh.

290 Tons, Glendale, Calif., Rossmoyne district reservoir, through Nathan A. Moore, to Blue Diamond Corp.

200 Tons, Chicago, Goldblatt Bros., Inc., warehouse, to Joseph T. Ryerson & Son Co., Inc., Chicago.

190 Tons, Merced County, Calif., four bridges, Black Rascal Canal, through Gunner Corp., to Gilmore Steel Fabricators.

150 Tons, Springfield, Ill., Franklin Life Insurance Co., building to Ceco Steel Products Corp., Chicago.

150 Tons, Hillsdale, Mich., grain elevator, to Carnegie-Illinois Steel Corp., Pittsburgh.

130 Tons, Huron, Ohio, Eastern States Milling Corp., grain elevator foundations, to Carnegie-Illinois Steel Corp., Pittsburgh.

130 Tons, Chicago, Ravenswood Hospital, to Ceco Steel Products Corp., Chicago, through H. B. Barnard, contractor.

• • • **Reinforcing bar** inquiries this week included the following:

5325 Tons, Norfolk, Va., Norfolk & Western RR, coal pier.

750 Tons, Milwaukee, Miller Brewing Co., building.

500 Tons, Chicago, Walter H. Johnson Candy Co., building.

445 Tons, Alameda County, Calif., bridge and overhead crossing across Alameda Creek, near Sunol, California Div. of Highways, Sacramento, bids due May 15.

285 Tons, Columbus, Ohio, state highway department opening.

210 Tons, Ottumwa, Iowa, Wapello County Sanitorium.

200 Tons, Witchita, Kans., Western Auto Stores, building.

180 Tons, Burlington, Iowa, Raytheon Mfg. Co., building.

150 Tons, Mankato, Minn., Archer Daniels Midland Co., building.

• • • **Piling awards** this week included the following:

4400 Tons, Toledo, Ohio, fabricated piling, Carnegie-Illinois Steel Corp., to American Bridge Co., Pittsburgh.

• • • **Piling inquiries** this week included the following:

3000 Tons, Peoria, Ill., Caterpillar Tractor Co., engine building, alternate bids on concrete and combination piling.

• • • **Plate awards** this week included the following:

420 Tons, Cedar Falls, Wash., portion of Cedar Falls penstock No. 5, through Paul Jarvis, Inc., to Steel Tank & Pipe Co.

200 Tons, Groton, Conn., standpipe to Pittsburgh Des Moines Steel Co.

Sells 215 Surplus Plants

Washington

• • • **Of a total** of 673 plant facilities representing a government investment of $3.3 billion which had been declared surplus at the end of the first quarter 1946, 215 have been sold, WAA announces. A return of $223 million was realized for the properties which originally cost $375 million.

This does not include 76 properties representing an original cost of $450 million which have been leased for varying periods, ranging from 6 months to 20 yr.

Foundry Prices Up

Washington

• • • **Price increases** for producers of malleable and grey iron castings will be issued by OPA within the next week. The increases will be of varying percentages depending upon the periods in which current price levels were fixed and will offset that part of the wage and salary increases granted by producers of these products which cannot be absorbed. OPA says the increases will also remove disparities in base period prices and those fixed by formula during the various periods.

The London ECONOMIST

Topside on the Ship of State

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ANYONE who has ever seen an ostrich gobble up half a dozen oranges, and has watched the swellings take their slow way down the long, thin neck, will know what the State Dept. looks like in these curious days. Parts of the Foreign Economic Administration, of the Office of Strategic Services, the Office of War Information, the Office of Inter-American Affairs, Lend-Lease and Surplus Property are all in the process of being swallowed, but they still bulge.

The ostrich is not very happy. It faces two harassing and simultaneous tasks — it must digest the oranges, and it must rid itself of the habit of keeping its head in the sands of leisurely meditation.

In the field of foreign economic policy, the battle of the bulge seems, at the present time, to be proceeding with some hope of success. The problem is to find how the various wartime agencies dealing with different aspects of that policy could be best absorbed into the peacetime State Dept. Conversely, it is to find how the policies of other cabinet departments which deal with foreign matters could be coordinated with that of the State Dept. The present solution is a series of interdepartmental committees which cut horizontally across the work of the cabinet offices concerned and link them at the relevant levels.

OF these new interdepartmental committees, four are concerned with economic angles of foreign policy. Mr. William Clayton, Assistant Secretary of State for Economic Affairs, is chairman of two of them—the Executive Committee on Foreign Economic Policy and the Air Coordinating Committee. A third, the Telecommunications Coordinating Committee, is still in the process of creation, with its headship unannounced. The fourth is the National Advisory Council on International Monetary and Financial Problems, created in July under Bretton Woods legislation.

The chief job of these committees is to see to it that when the United States speaks on one problem or another in their various fields it speaks with a single voice, if not with an undivided mind. The members of the Executive Committee on Foreign Economic Policy, for example, are representatives, at the Assistant Secretary level, of the Departments of State, Treasury, Agriculture, Commerce, Labor and the Tariff Commission, and it has liaison members from War and Navy. Its working secretariat is within the State Dept. A variety of subcommittees on such matters as an agricultural policy, trade expansion, international commodity problems and international economic organization, composed of representatives of the departments concerned, thrash out details and provide working drafts which then move up from level to level until they emerge as statements of American policy on the problem under discussion. Those statements go out to operating agencies as the working basis from which action starts or is governed.

THE need for such a committee, designed to formulate the segments of a coherent economic policy in many fields, has become particularly acute since the end of the war. The earlier fiction that all government business that touched on foreign affairs, whatever its nature, was segregated to the State Dept. has no possible basis in the present world. The need for regulating cotton crops in Texas and in Egypt may demand the attention of Agriculture, Commerce, Federal Reserve and the War Dept., all of them, perhaps, with different ideas as to what should be done and how. On the other hand, the State Dept. remains the executive division to which other governments speak and through which the word of this government is transmitted abroad. If that primary function is to be preserved, some way must be found whereby the external interests of other departments can be channelled back and forth, through the State Dept., without too much delay and dissatisfaction.

This new committee solution traces its ancestry back to the Inter-Departmental Trade Agreements Committee set up in 1934, when Mr. Cordell Hull, then Secretary of State, first brought political techniques to bear on the inert wreck of the international trading system. That committee, under the guidance of Mr. Harry Hawkins (now Economic Counsellor to the American Embassy in London), was successful in breaking through the barrier of interdepartmental jealousies which is always a hazardous business in any cabinet. It had a successor, the Executive Committee on Commercial Policy, which was scrapped when the carefully nurtured new twigs of trade vanished under war pressures. But the pattern and the idea remained in men's minds. In the spring of 1944, with the war's end visible, the present Executive Committee on Foreign Economic Policy was set up along similar lines.

AS a device for correcting the twin American habits of starting off in all directions and speaking before thinking — habits familiar enough at home, but now being recognized as too costly and dangerous in foreign affairs—the intra-cabinet committee has potentialities of real value. Whether it can survive the various pressures brought to bear on it within the

(CONTINUED ON PAGE 170)

Industrial Briefs...

• HELP WANTED — Technical men are needed in the following fields: Chemicals, aeronautics, automotive, machine tools, general industrial equipment, fuels and lubricants, metals and minerals, communications equipment, scientific instruments, shipbuilding, and textiles. A knowledge of technical German is essential. Appointments are subject to Civil Service approval and are made for a minimum of six months. Contact John C. Green, executive secretary, Office of the Publication Board, Dept. of Commerce, Washington 25, D. C.

• FURNACE OUTPUT—Kalamazoo Stove & Furnace Co., Kalamazoo, Mich., is on the verge of substantial production of new gas ranges and furnaces, with general distribution expected to be completed among dealers and distributors within the next 30 days. The company has spent $2,500,000 in planning new models and converting its plant here to automobile production line methods. Projections call for output of furnaces at a rate five times that of any prewar year.

• WEST COAST OFFICE — The Sterling Engine Co., Buffalo, has announced the opening of a factory branch in San Francisco with Hans Bohuslav, vice-president and director of engineering development, as manager. Al Hahn has been appointed assistant manager of the new unit.

• BUYS FOUNDRY — American Brake Shoe Co. has contracted to purchase the Progressive Foundry Works, Inc. of Rochester, N. Y., subject to approval of Progressive's stockholders. The new plant will be operated as a new division of American Brake Shoe. It will be under the direction of W. T. Kelly, Jr., who is also president of Brake Shoe's Kellogg Div. No changes in personnel are contemplated.

• GETS ENGINE ORDER—Orders for 500 Franklin helicopter engines have just been received by Aircooled Motors, Inc., for installation in helicopters designed and built by Bell Aircraft Corp., Buffalo. Most of the engines are for commercial and industrial helicopters, while a few will power similar aircraft for the Army Air Forces.

• OPENS LONDON OFFICE — Rheem Mfg. Co., makers of steel shipping containers and basic household appliances, are establishing London offices in conjunction with the extension of operations within the British Empire. Lanning Roper will be in charge of the London office.

• SELLS PLANTS — The Wright Aeronautical Corp. has entered into an agreement with the Aero Holding Co. of New Jersey for the sale of its Paterson properties known as Plants 1 and 2.

• FORMS OWN COMPANY — Dr. Norman E. Woldman has resigned as chief metallurgical Engineer of the Eclipse-Pioneer Div., Bendix Aviation Corp., to establish his own company, Norman E. Woldman, Inc., Upper Montclair, N. J. for the general metallurgical and chemical engineering consulting practice.

• BUYS PULLMAN PLANT—The National Radiator Co. has purchased the Pullman-Standard Car Co.'s plant at Middletown, Pa. The plant will be used for fabricating steel boilers for industrial and domestic purposes, pressure vessels, heat exchangers and other industrial products, formerly made at the firm's Lebanon plant.

• BRANCH OFFICE—Loftus Engineering Corp., Pittsburgh, announces the opening of a branch office at 185 N. Wabash Ave., Chicago. John H. Loux will be in charge.

German Scientists to Aid British Industry

London

• • • **In order to** place the best industrial intelligence from Germany at the disposal of British industry, 200 German scientists and technicians are to be brought over to Britain to work in a purely advisory capacity for a limited period.

Those chosen, all of them volunteers, will be research workers of exceptional brilliance or specialists in industrial techniques or processes likely to be of use in developing existing industries or establishing new branches. They will be employed by the British Government who will loan them to trade associations and research organizations, and all inventions or discoveries will be used to benefit industry as a whole. Although under certain circumstances opportunities of practical research may best be given by attachment to a particular firm, it is emphasized that there is no question of any German holding a position of authority or replacing any British worker.

During their stay in Britain they will be subject to the normal security safeguards attached to enemy aliens, and before final acceptance the political background of each will be thoroughly examined. They will be housed wherever practicable in hostels and nissen huts and will pay for their own board and lodging.

British Restrict Lead

London

• • • **Owing to the acute** world lead shortage, the British Government has decided that only a small amount can be allocated, from Apr. 1 onwards, to exports of low conversion value, i.e., lead oxides, white lead, sheet and pipe, solder, anti-friction metal and type metal.

Applications for export for the above uses are to be made through the Export Licensing Dept. at the British Board of Trade, and manufacturers are asked to confine their applications to really urgent overseas demands and for which there is a special reason for exporting.

BACK TO WORK: *Each of these freighters belonging to the Pittsburgh Steamship Co. fleet has a trip capacity of 115,000 gross tons of ore. The number of trips they will make this summer will depend on the coal strike, OPA and other imponderables.*

Ore Industry Faces Most Difficult Problems in History

Cleveland

By WILLIAM A. LLOYD

• • • **With iron ore stocks** on hand totaling some 27,000,000 gross tons, and with OPA and the coal strike as imponderables in the iron ore equation, competent observers estimate the total iron ore movement for 1946 in the immediate vicinity of 60,000,000 tons.

Some consumers have indicated that stocks on hand are sufficient to carry them well into May, since inventories aggregate 7,000,000 tons more than the 20,000,000 tons the steel industry would normally have on hand in a year when consumption is about 50,000,000 tons.

It is generally conceded by informed observers that the iron ore situation is a first class dilemma and that the iron ore industry faces some of the most difficult problems in its long history. While the total tonnage moved this year will admittedly be less, certainly no consumer, unless something rare and unforseen occurs, will want for ore.

While action on the wage dispute involving the independent companies is momentarily expected, along with action from OPA, some sources in the trade do not take a particularly optimistic view. Three obvious courses of action are open to OPA: the agency can stand pat, which is not likely, grant a price increase sufficient to meet new wage scale, or remove control entirely. The last action is as unlikely as the first.

Assuming OPA sticks to the bureaucratic notion of the middle of the road, some observers believe

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the industry is due for a 50¢ a ton increase on the underground ore. This, however, does not represent the complete answer, since the railroads have also applied for an increase in freight rates, which, if given, will to some extent change the focus established by the projected 50¢ a ton increase for the ore companies.

Despite their inventory condition, consumers will, of course, begin taking shipment as soon as negotiations at the mine are settled and output warrants. Pittsburgh Steamship Co. will start despatching its ships to the ore ports Apr. 22. This company is one of the few fleets to have ore for early loading, since the Oliver Iron Mining Co. made an agreement with its miners some weeks ago.

At the same time, it was reported that operators of iron ore receiving docks at Cleveland and points east of Cleveland on Lake Erie are contemplating closing their docks on Sundays and holidays this year, which would be the first break in a full 7-day and night operation for these docks since 1941.

Iron ore mining company officials were meeting here this week on the strike which is still under way in Michigan, where the miners have refused to participate in conferences with state and federal labor conciliators, pinning their hopes on negotiations to be held in Washington.

The principal demand of the union in the 64-day strike is an 18½¢ per hr wage increase. Companies have offered 10¢. The strike affects 8,345 members of the union on three Upper Peninsula ranges in Michigan. About 600 employees some weeks ago responded to a back-to-work invitation enabling officials of three iron mining companies to reopen nine mines which had been closed since the USW-CIO strike started over six weeks ago.

Machinery Price Up

Washington

• • • **An additional 5 pct** of the base price in effect Oct. 1, 1941, may be added to the retail ceilings of construction machinery and equipment. Effective Apr. 10, the new ruling applies until June 15. The increase is in addition to the 5 pct interim increase already in effect. Resellers are permitted the same percentage added by the manufacturers.

The existing increase is due to expire May 15 but has been found to be insufficient to enable maximum production. The new price ceilings are given an end date because production is below normal and OPA said it therefore was not able to undertake a cost study showing what cost increases over 1941 should be allowed on a permanent basis.

Labor Dept. Examines Consumers'

Pittsburgh

• • • **The U. S. Dept.** of Labor, Bureau of Labor Statistics in 1943 prepared for the use of OPA and WPB officials a study on "Consumers' Prices of Steel Products." This study was made at the request of the Iron and Steel Branch of the Office of Price Administration and had a fourfold purpose. (1) It describes the changes in the price of steel from January 1939 to April 1942. (2) It was intended to determine the relationship between actual prices or delivered prices to published prices. (3) It was hoped that there would be shown the relative importance of the base price, extras and freight as components of the delivered price. (4) Information was sought on which to set up periodic reporting of actual prices paid by consumers of steel. The report does not appraise the possibility of establishing regular reporting of steel prices of consumers, but it is clear from the survey, according to the Dept. of Labor, that such a reporting system is practicable.

As a result of the study, which was national in scope and very broad from the standpoint of steel consuming industries, some 13 conclusions were reached. The breadth of the conclusions and their effect on the economic structure of the steel industry have been summarized.

(1) Actual delivered prices paid by steel consumers deviate frequently from published delivered prices. By published price is meant the sum of published base price at the basing point nearest the consumer plus published extras applicable to the given specification plus rail freight from the basing point to the consumer's plant.

(2) Actual prices fall below published prices when steel mills are not operating close to capacity and the market is highly competitive, but closely approach and sometimes exceed published prices during periods of capacity operation when little competition exists.

(3) Changes in actual delivered prices are due mainly to changes in either base price or extras. On products for which extras are an important element of the delivered price, changes in price tend to be made by varying the charges for extras. On products for which extras are not an important element in the delivered price, changes in price tend to be made by varying the base price.

(4) The relative importance of the three components of the delivered price is approximately as follows: base price, 79 pct; extras, 14 pct; and freight, 7 pct.

(5) Base prices alone are neither good measures of the level of prices of steel nor adequate indicators

TABLE I—Steel Ingot Production Compared with Indexes of Published Base Prices[1] and Indexes of Actual Delivered Prices[2] of Eight Steel Products, April 1942 = 100
Selected Quarters 1939-42

Period	Steel Ingot Production	INDEXES							
		Hot Rolled Sheets		Cold Rolled Sheets		Hot Rolled Strip		Cold Rolled Strip	
	Pct of Capacity[3]	Published Base Prices	Actual Delivered Prices	Published Base Prices	Actual Delivered Prices	Published Base Prices	Actual Delivered Prices	Published Base Prices	Actual Delivered Prices
Second Quarter 1939	51	98	92	102	95	98	92	102	91
Third Quarter 1939	63	95	88	100	92	95	86	100	89
Second Quarter 1940	72	97	94	98	95	97	95	98	91
Second Quarter 1941	98	100	99	100	99	100	100	100	94
Fourth Quarter 1941	98	100	100	100	100	100	[4]	100	97
Second Quarter 1942	98	100	101	100	101	100	100	100	101

Period	Steel Ingot Production	INDEXES							
		Merchant Bars		Cold Finished Bars		Plates		Structural Shapes	
	Pct of Capacity[3]	Published Base Prices	Actual Delivered Prices	Published Base Prices	Actual Delivered Prices	Published Base Prices	Actual Delivered Prices	Published Base Prices	Actual Delivered Prices
Second Quarter 1939	51	101	99	101	99	100	97	100	97
Third Quarter 1939	63	100	98	100	98	100	97	100	96
Second Quarter 1940	72	100	99	100	98	100	98	100	98
Second Quarter 1941	98	100	99	100	98	100	100	100	99
Fourth Quarter 1941	98	100	100	100	99	100	102	100	100
Second Quarter 1942	98	100	101	100	100	100	103	100	101

[1] Computed by averaging monthly base prices in *The Iron Age*, Jan. 7, 1943, pp. 205-208 (April 1942=100).
[2] These are percentages of actual prices paid to April 1942, published delivered prices.
[3] From *The Iron Age*, Jan. 7, 1943, p. 204.
[4] No data tabulated for this quarter.
Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

Prices of Steel Products . . .

of the comparative prices of different steel products. Some products such as hot-rolled strip, commodity cold-rolled strip, cold-finished carbon bars, cold-finished alloy bars are not for sale at the base price regardless of specification.

(6) Extras, especially during the early war years, assumed increasing importance as a component of the delivered price.

(7) Freight costs increased for many steel consumers as a result of dislocated tonnage, or change in basing point from that nearest the consumer to that nearest the mill, as well as change from the basing point system to an f.o.b. mill basis.

(8) Invoice prices paid by consumers for certain steel products advanced markedly between the second quarter of 1939 and the second quarter of 1942—in some cases as much as 25 to 50 pct. However, some consumers paid the published prices throughout the period.

(9) Actual prices varied from 50 to 135 pct of April 1942 published delivered prices during the period covered, while published prices remained stable.

(10) By the second quarter of 1941 actual prices paid for most steel products closely approximated published prices and were stable for the remainder of time covered by the survey. The mills were operating at or near capacity and had removed most of the price concessions, introduced new extras, enforced more rigid interpretation and use of published extras, and were changing basing points from those nearest the consumer to those nearest the mill.

(11) In 1939 and 1940, when steel mills operated at an average of 65 and 82 pct of capacity, respectively, consumers received concessions from published prices as shown in table I. These concessions were granted by the waiving of certain extras, reduction in base prices, downgrading; that is, computing the price on a less expensive specification than that of the product actually sold the consumer, by special quantity discounts, and by quoting prices which had no logical basis except to meet competition.

(12) The extent of price concessions shown by this survey is probably understated. First, it is likely that certain big consumers not included in the study receive large concessions; and second, the price series obtained, with few exceptions, do not include those concessions which take the form of rebates based upon the volume of steel purchased during a given period.

(13) The price the consumer pays for steel does not depend as much upon the pricing system used as it does upon the degree of competition existing among the mills.

During the course of the survey, 1063 steel consumers were interviewed in practically every major steel consuming industry, located in every important industrial center in the United States. Over 2200 price series were obtained from the 629 firms yielding usable data.[1] Products chosen were those for which consumers' specifications remained unchanged during the pricing period. A breakdown of delivered unit price into the components of base price, extras and freight was obtained from the purchasing agent of each firm.

Price data were not taken from those firms purchasing less than carlot quantities or purchasing from warehouses or jobbers, from firms not regularly purchasing products of a given specification, or from firms that were subsidiaries of steel producing companies.

The 629 firms included in the sample purchased

Steel Pricing Conditions

Pittsburgh

. . . Since the basic structure of steel prices did not change materially between April 1942 and February 1946, this report is published to show pricing conditions that are rather generally accepted. This study was used by OPA and probably had considerable bearing on the outcome of negotiations for increases in price ceilings for steel. The report does not take into consideration any factors except steel prices and pricing methods and is intended neither as a criticism nor a justification of the pricing policies of the industry. It is a study that directly shows the U. S. Dept. of Labor's thinking as to steel prices and pricing methods.

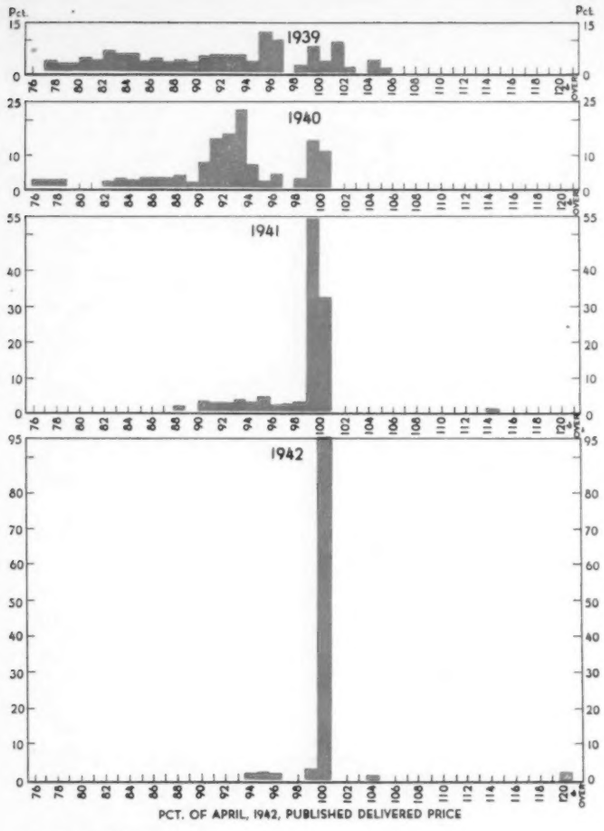
The report was written by Willard Fazar and Fay Bean of the Bureau of Labor Statistics under the supervision of Kenneth Hunter and is published in THE IRON AGE by permission of the U. S. Dept. of Labor.

TABLE II—Ratios of Base Price, Extras and Freight To Delivered Price of Eight Steel Products

April 1939 to April 1942

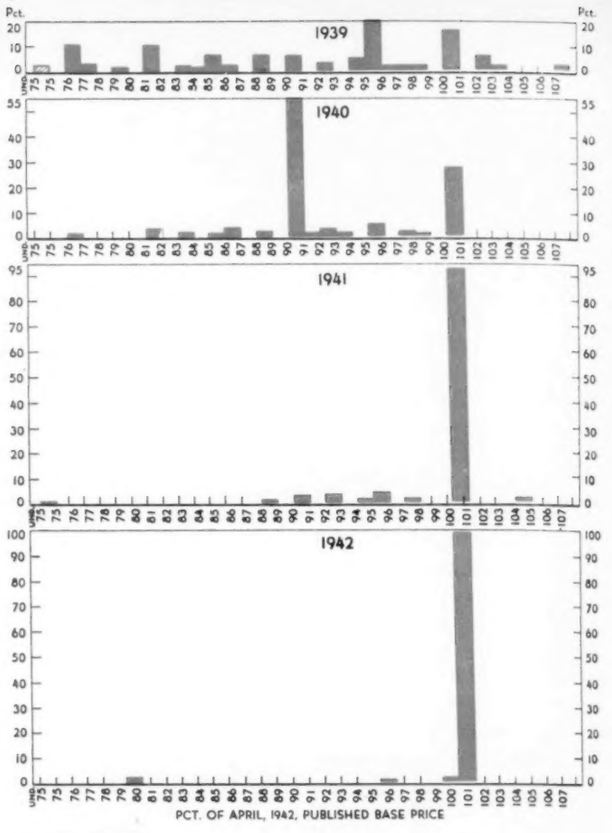
Product	Base Price	Extras	Freight	Delivered Price
	Pct	Pct	Pct	Pct
Hot-rolled sheets	74.6	19.8	5.6	100.0
Cold-rolled sheets	89.6	5.8	4.6	100.0
Hot-rolled strip	75.2	17.8	7.0	100.0
Cold-rolled strip	60.0	35.0	5.0	100.0
Merchant bars	87.1	6.0	6.9	100.0
Cold-finished bars	69.8	25.3	4.9	100.0
Plates	86.3	3.3	10.4	100.0
Structural shapes	88.8	1.5	9.7	100.0
Average	78.9	14.3	6.8	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.



U. S. DEPT. OF LABOR
BUREAU OF LABOR STATISTICS

FIG. 1—HOT-ROLLED SHEETS: Distribution of invoice prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.



U. S. DEPT. OF LABOR
BUREAU OF LABOR STATISTICS

FIG. 2—HOT-ROLLED SHEETS: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.

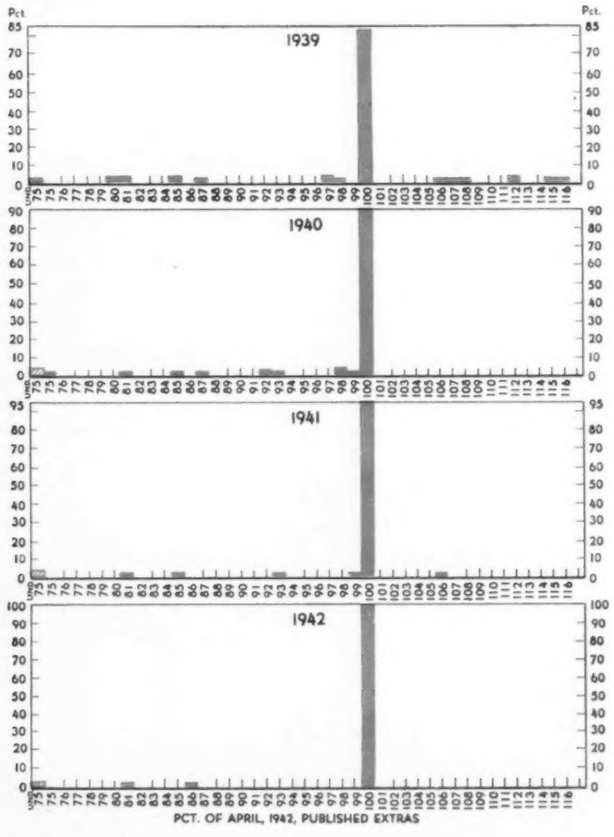


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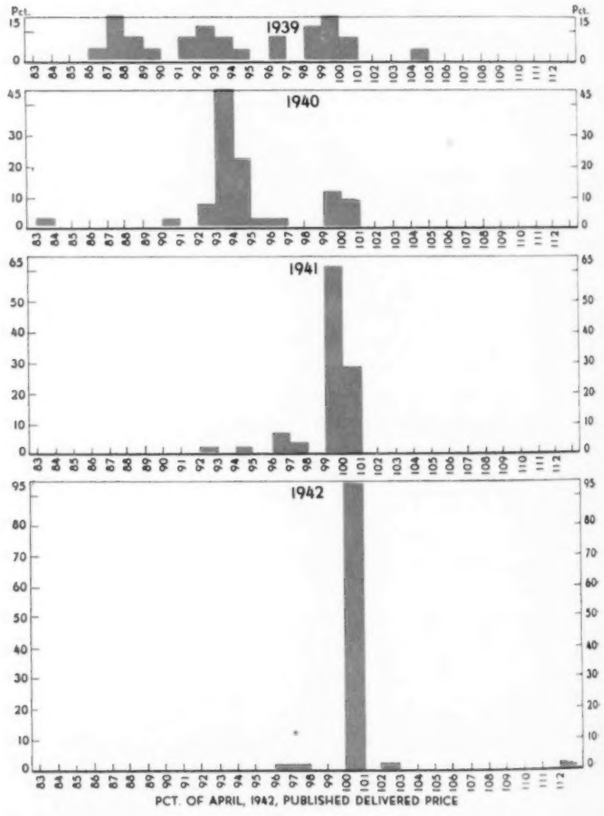
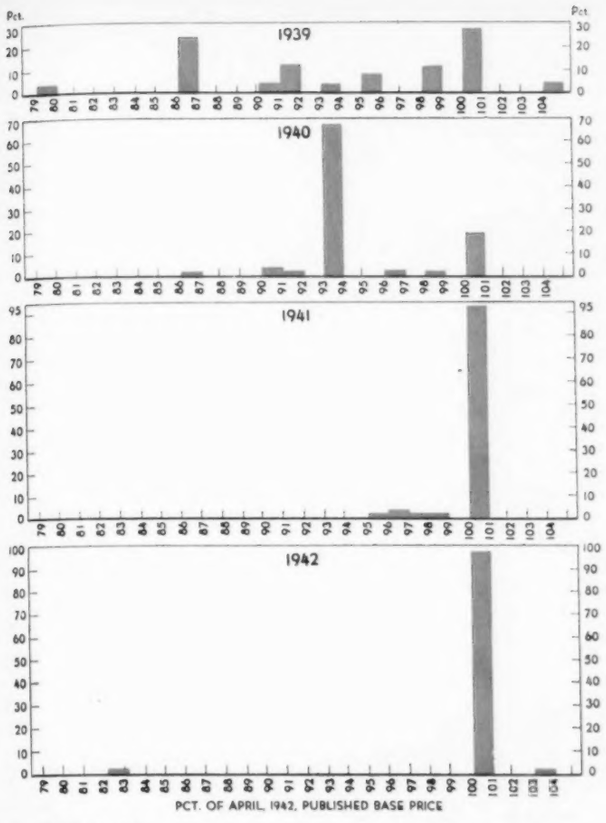
FIG. 3—HOT-ROLLED SHEETS: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.



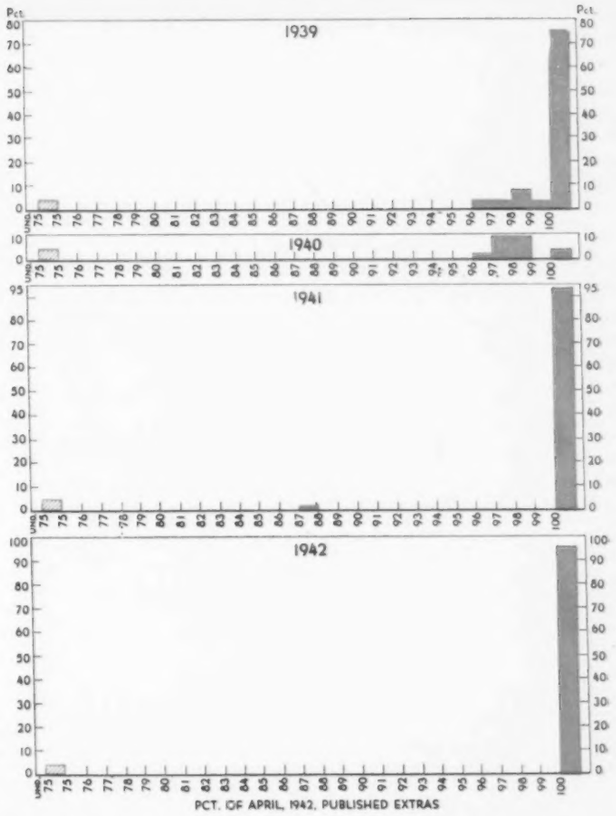
U. S. DEPT. OF LABOR
BUREAU OF LABOR STATISTICS

FIG. 4—COLD-ROLLED SHEETS: Distribution of delivered invoice prices of steel purchased by consumers as percentages of April 1942 published delivered prices for second quarter, 1939-42.



U. S. DEPT. OF LABOR
BUREAU OF LABOR STATISTICS

FIG. 5—COLD-ROLLED SHEETS: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.



U. S. DEPT. OF LABOR
BUREAU OF LABOR STATISTICS

FIG. 6—COLD-ROLLED SHEETS: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.

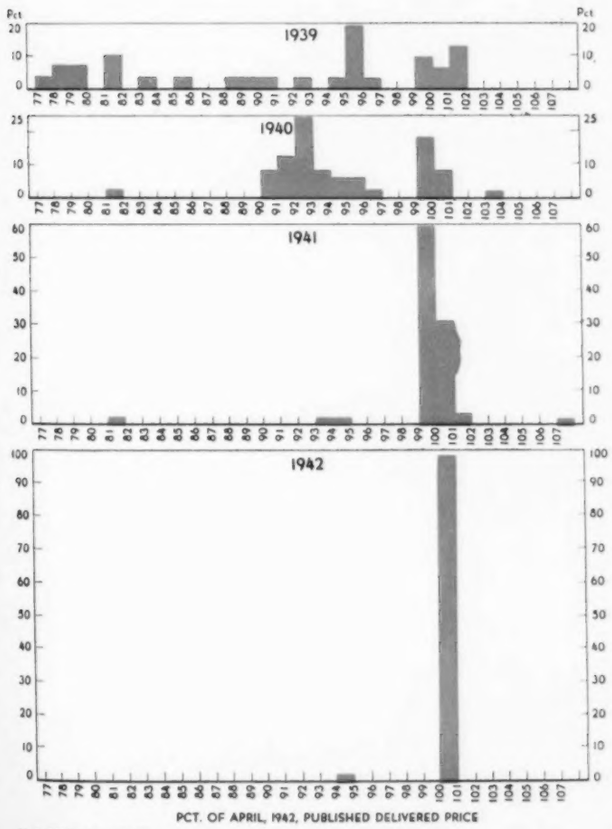


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FIG. 7—HOT-ROLLED STRIP: Distribution of delivered invoice prices of steel purchased by consumers as percentages of April 1942 published delivered prices for second quarter, 1939-42.

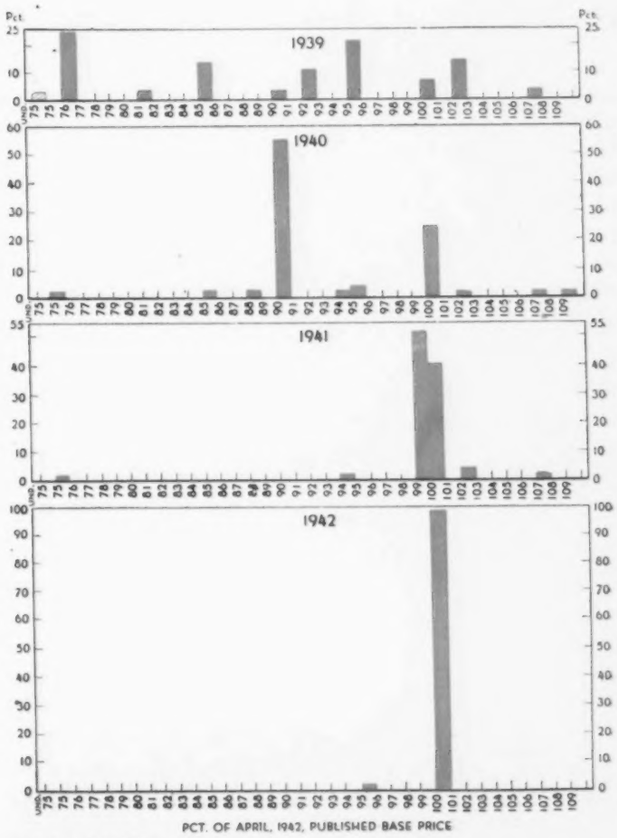

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FIG. 8—HOT-ROLLED STRIP: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.

7,300,000 net tons of steel in 1940, the value of which amounted to nearly $431,000,000. These purchases amounted to about 15 pct of the total 1940 steel production (both semifinished and finished steel) of 48,660,000 net tons.[2]

This analysis is based upon a detailed price study of eight important steel products: Hot-rolled sheets, cold-rolled sheets, hot-rolled strip, cold-rolled strip, merchant bars, cold-finished bars, plates and structural shapes. Because these products account for more than half of the total steel tonnage consumed,[2] an analysis of their prices may be accepted as fairly representative of all steel products.

Actual delivered prices paid for these eight steel products, as shown by purchase invoices of consumers, were compared with the published delivered prices in effect in April 1942. The published prices were built up for each price series by using the April 1942 base price at the basing point nearest the consumer's plant as reported in THE IRON AGE, plus extras applicable to the specification as given by the consumer, plus rail freight from basing point to consumer's plant computed on rates in effect in April 1942. The extras were taken from the lists of extras and deductions of the Carnegie-Illinois Steel Corp., the Bethlehem Steel Co., and the Republic Steel Corp.[3]

The comparisons of actual prices in several quarters of 1939, 1940, 1941 and 1942 with the April 1942 published prices were then arranged by product as frequency distributions.

Published prices as used did not necessarily represent ceiling prices although maximum prices on steel products were established by OPA on the basis of April 1941 published prices. Under the maximum price regulations certain exceptions to regular base prices were granted by OPA to marginal mills, and some provisions for emergency basing points and dislocated tonnage were made. These exceptions were not taken into consideration in building up published prices for this study.

Published Prices v. Actual Prices. Published prices are not usually accurate or dependable measures of actual prices paid for steel products. Published prices remain relatively stable while actual prices may show considerable fluctuation. Between the second quarter of 1939 and the second quarter of 1942, month-

TABLE IV—Extras Applicable to Hot Rolled Strip 1933, 1939-43 ($ per 100 lb)

1933[1]		1939 – 1943[2]	
Extras	Range	Extras	Range
Size—width[3]	Base to 4.75	Size—width[4]	0.05 to 4.75
Cutting	Base to 0.90	Cutting	0.10 to 0.90
Quality	0.10 to 0.50	Quality	0.10 to 0.60
Sketches	0.20 to 0.50	Sketches	0.20 to 0.50
Quantity	0.03 to 1.20	Quantity	0.50 to 1.00
Drawing and heating	0.15 to 0.25	Heating	0.25 to 0.65
McQuaid—Ehn Tests	0.60		
Chemical Specifications	Base to 0.40	Chemical Specifications	Base to 0.50
Tolerances	0.20	Tolerances	0.20
		Restricted Chemical	0.025 to 0.05
		U. S. Navy Specification	0.25 to 1.00
		Bevel edge sections	0.15
		Boxing and crating	0.25
		Close Tolerances	0.20 to 0.40
		Cambering	0.10 to 0.30
		Slitting	0.25 to 0.55
		Pickling	0.25 to 1.25

[1] Carnegie Steel Co. List of Extras Sept. 20, 1933.
[2] Carnegie-Illinois Steel Corp., List of Extras Nov. 28, 1939.
[3] Width is quoted to 23 15/16 in.
[4] Width is quoted only to 12 in. No base price is listed.
Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

TABLE III—Extras Applicable to Structural Shapes, 1917, 1925, 1933, 1940-43 ($ per 100 lb)

1917[1]		1925[2]		1933[3]		1940–43[4]	
Extras	Range	Extras	Range	Extras	Range	Extras	Range
Size	0.10	Size	0.10 to 0.30	Size and section	0.10 to 0.50	Size and section	0.10 to 0.75
Cutting	0.25 to 1.55	Special cutting	0.25			Special cutting	0.10 to 0.20
		Length	0.10 to 1.55	Length	0.10 to 1.55	Length	0.05 to 1.55
		Inspection	(variable)	Inspection	(variable)		
		U. S. Navy Specification	0.10 to 1.00	U. S. Navy Specification	0.10 to 1.00	U. S. Navy Specification	0.10 to 2.95
				ASTM Specification	0.60 to 0.75	ASTM Specification	0.40 to 0.75
				Cambering	Quoted on inquiry	Cambering	0.10
				Chemical requirement	0.10 to 0.25	Chemical requirement	0.10 to 0.65
						Restricted chemical requirement	0.025 to 0.05
						Milling	1.50 to 6.50[5]
						Splitting beams	0.05 to 0.50
						Painting	0.10 to 0.20
						Special marking	0.05
						Protected shipment	0.05
						Surface finish	0.15
						Federal specification	0.10 to 0.35
						Quantity	0.25 to 0.50
						Test requirement	0.10 to 0.25
						Restricted physical test	0.10

[1] Bethlehem Steel Corp. List of Extras, Nov. 1, 1917.
[2] Jones & Laughlin Steel Corp. List of Extras, Nov. 20, 1925.
[3] Carnegie Steel Corp. List of Extras, Sept. 20, 1933.
[4] Bethlehem Steel Corp. List of Extras, July 5, 1940.
[5] Milling extra charged per piece rather than per 100 lb.
Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

ly published base prices of the eight steel products studied varied by no more than 5 pct, as shown in table I. During the same period prices actually paid for the different products varied widely. In the third quarter of 1939 the averages of actual prices of the eight products considered in this report were 2 to 14 pct below the April 1942 published prices, but by the second quarter of 1941 they closely approximated April 1942 published prices.

Many consumers are quoted prices below published prices when steel mills are not operating close to capacity and the market is competitive. It is apparent from table I that when the industry operated at 51 pct of capacity in the second quarter of 1939, actual prices paid were lower than in other quarters when the mills operated close to capacity, despite the fact that there were only minor changes in published prices of most products.

During the period of capacity operation after the second quarter of 1941, actual prices closely approached and sometimes exceeded published prices. Almost all of the purchases when the mills were operating at 96 pct or more of capacity were made at or above the published prices. This is illustrated by the data in table I.

It is difficult to justify, from a cost of production approach, the fact that increased volume is accompanied by higher prices in the steel industry, since the

TABLE V—Hot-Rolled Sheets

Distribution of Delivered Invoice Prices of Steel Purchased By Consumers As Percentages of April 1942 Published Delivered Prices

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1939 Third Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
75.0 - 75.9	..	....	1	0.6	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	1	0.5	..	....	..	....	..	....
77.0 - 77.9	3	2.2	7	4.0	1	0.5	..	....	..	....	..	....
78.0 - 78.9	2	1.5	7	4.0	1	0.5	..	....	..	....	..	....
79.0 - 79.9	2	1.5	7	4.0	..	....	..	....	..	....	..	....
80.0 - 80.9	5	3.6	11	6.2	..	....	..	....	..	....	..	....
81.0 - 81.9	4	2.9	6	3.4	..	....	..	....	..	....	..	....
82.0 - 82.9	7	5.1	13	7.3	1	0.5	..	....	..	....	..	....
83.0 - 83.9	6	4.4	9	5.1	3	1.4	..	....	..	....	..	....
84.0 - 84.9	6	4.4	11	6.2	2	1.0	..	....	..	....	..	....
85.0 - 85.9	3	2.2	8	4.5	3	1.4	..	....	..	....	..	....
86.0 - 86.9	4	2.9	14	7.9	3	1.4	..	....	..	....	..	....
87.0 - 87.9	3	2.2	4	2.3	3	1.4	..	....	..	....	..	....
88.0 - 88.9	4	2.9	4	2.3	5	2.4	1	0.4	..	....	..	....
89.0 - 89.9	3	2.2	2	1.1	1	0.5	..	....	..	....	..	....
90.0 - 90.9	5	3.6	3	1.7	13	6.2	4	1.6	..	....	..	....
91.0 - 91.9	6	4.4	10	5.6	27	12.9	3	1.2	..	....	..	....
92.0 - 92.9	6	4.4	4	2.3	30	14.2	3	1.2	..	....	..	....
93.0 - 93.9	6	4.4	5	2.8	44	21.0	6	2.4	2	0.8	..	....
94.0 - 94.9	4	2.9	7	4.0	12	5.7	4	1.6	2	0.8	1	0.4
95.0 - 95.9	15	10.9	20	11.3	2	1.0	8	3.2	9	3.5	2	0.8
96.0 - 96.9	12	8.8	15	8.5	7	3.3	2	0.8	3	1.2	1	0.4
97.0 - 97.9	..	....	1	0.6	..	....	3	1.2	..	....	..	....
98.0 - 98.9	2	1.5	2	1.1	4	1.9	4	1.6	3	1.2	..	....
99.0 - 99.9	9	6.6	3	1.6	27	12.8	135	53.3	152	58.5	4	1.6
100.0 - 100.9	4	2.9	3	1.6	20	9.5	79	31.1	81	31.2	237	94.4
101.0 - 101.9	11	8.0	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	1	0.7	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	3	2.2	..	....	..	....	..	....	1	0.4	1	0.4
105.0 - 105.9	1	0.7	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	1	0.4	..	....
110.0 - 110.9	..	....	..	....	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	..	....	..	....	..	....	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	1	0.4	1	0.4	..	....
115.0 - 115.9	..	....	..	....	..	....	..	....	..	....	..	....
116.0 - 116.9	..	....	..	....	..	....	..	....	..	....	..	....
117.0 - 117.9	..	....	..	....	..	....	..	....	..	....	..	....
118.0 - 118.9	..	....	..	....	..	....	..	....	2	0.8	..	....
119.0 - 119.9	..	....	..	....	..	....	..	....	..	....	..	....
120.0 - 120.9	..	....	..	....	..	....	..	....	..	....	1	0.4
121.0 - 121.9	..	....	..	....	..	....	..	....	..	....	..	....
122.0 - 122.9	..	....	..	....	..	....	..	....	..	....	..	....
123.0 - 123.9	..	....	..	....	..	....	..	....	..	....	..	....
124.0 - 124.9	..	....	..	....	..	....	..	....	..	....	..	....
125.0 - 125.9	..	....	..	....	..	....	..	....	..	....	..	....
126.0 - 126.9	..	....	..	....	..	....	..	....	1	0.4	..	....
127.0 - 127.9	..	....	..	....	..	....	..	....	..	....	..	....
128.0 - 128.9	..	....	..	....	..	....	..	....	..	....	..	....
129.0 - 129.9	..	....	..	....	..	....	..	....	..	....	3	1.2
130.0 - 130.9	..	....	..	....	..	....	..	....	1	0.4	..	....
131.0 - 131.9	..	....	..	....	..	....	..	....	..	....	..	....
132.0 - 132.9	..	....	..	....	..	....	..	....	..	....	..	....
133.0 - 133.9	..	....	..	....	..	....	..	....	..	....	1	0.4
134.0 - 134.9	..	....	..	....	..	....	..	....	..	....	..	....
TOTAL	137	100.0	177	100.0	210	100.0	253	100.0	259	100.0	251	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

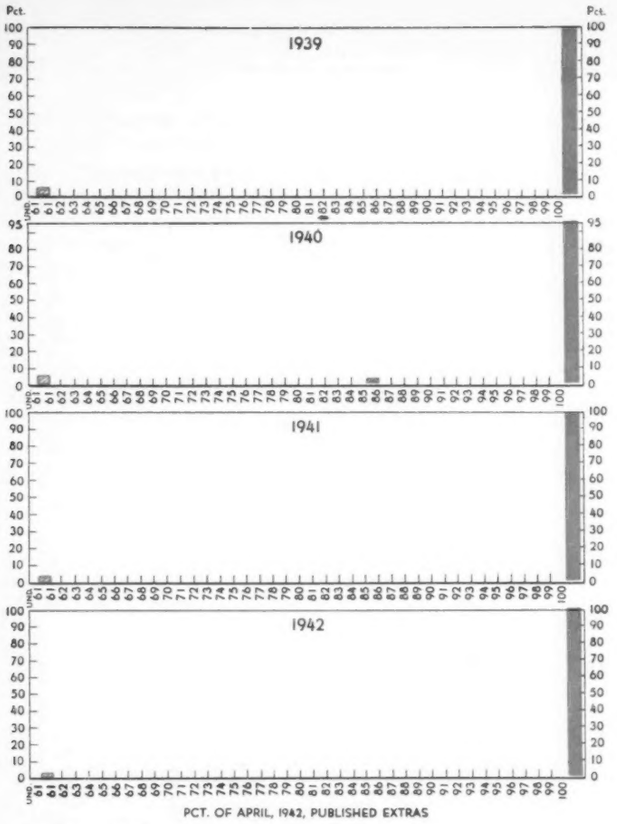

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FIG. 9—HOT-ROLLED STRIP: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.

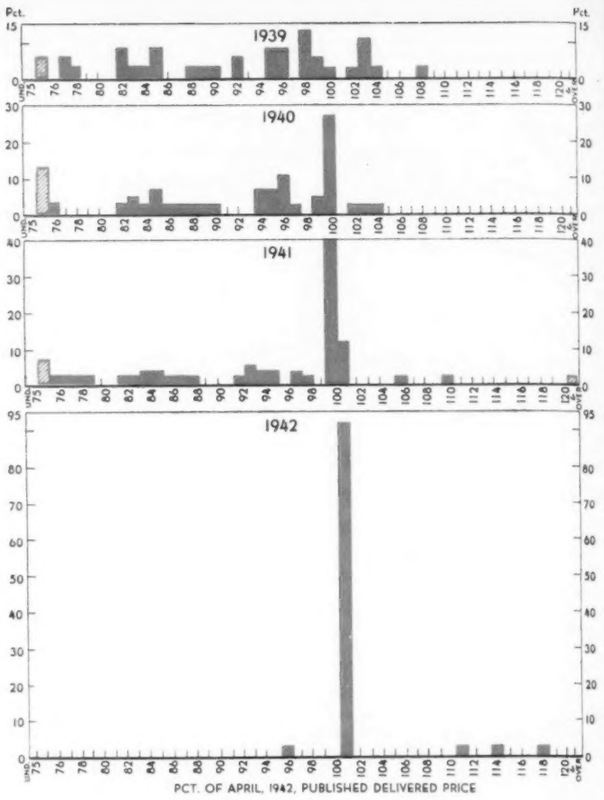

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FIG. 10—COLD-ROLLED STRIP: Distribution of delivered invoice prices of steel purchased by consumers as percentages of April 1942 published delivered prices for second quarter, 1939-42.

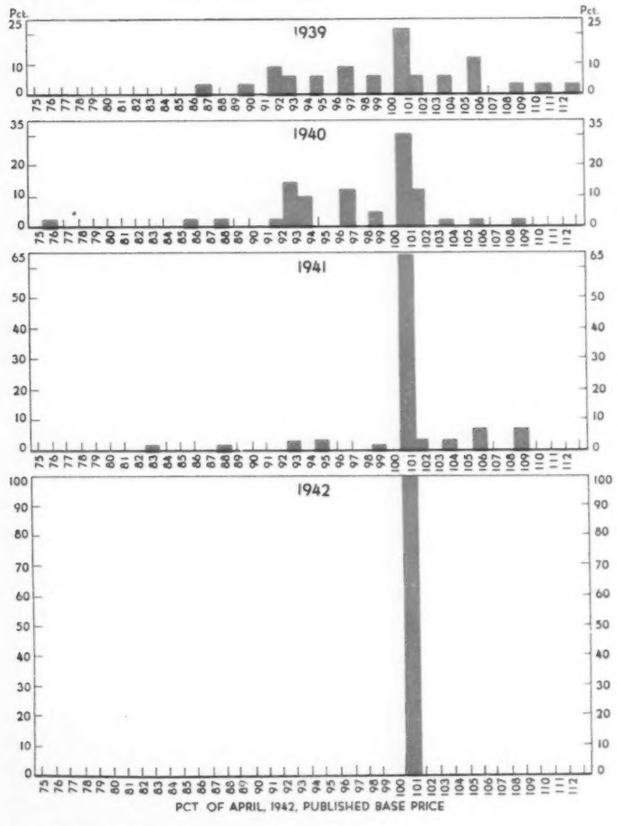

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FIG. 11—COLD-ROLLED STRIP: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.

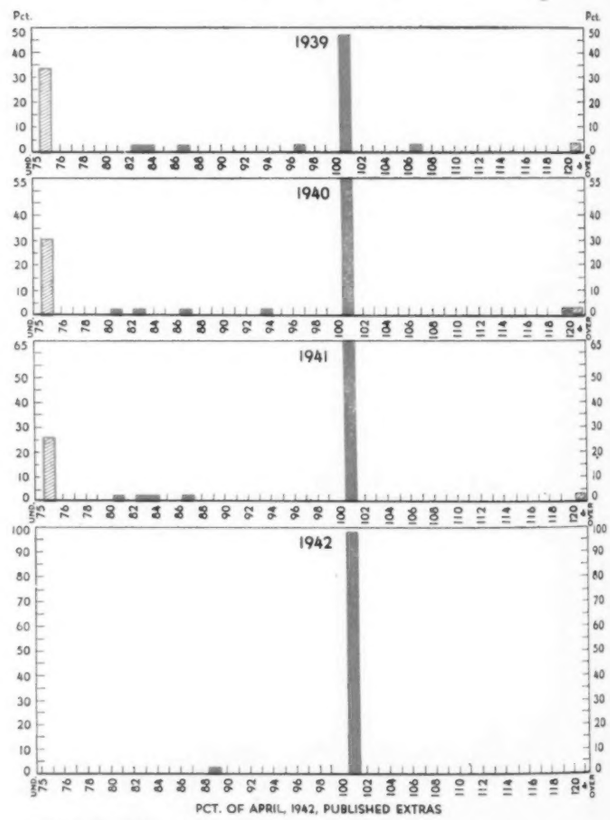

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FIG. 12—COLD-ROLLED STRIP: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.

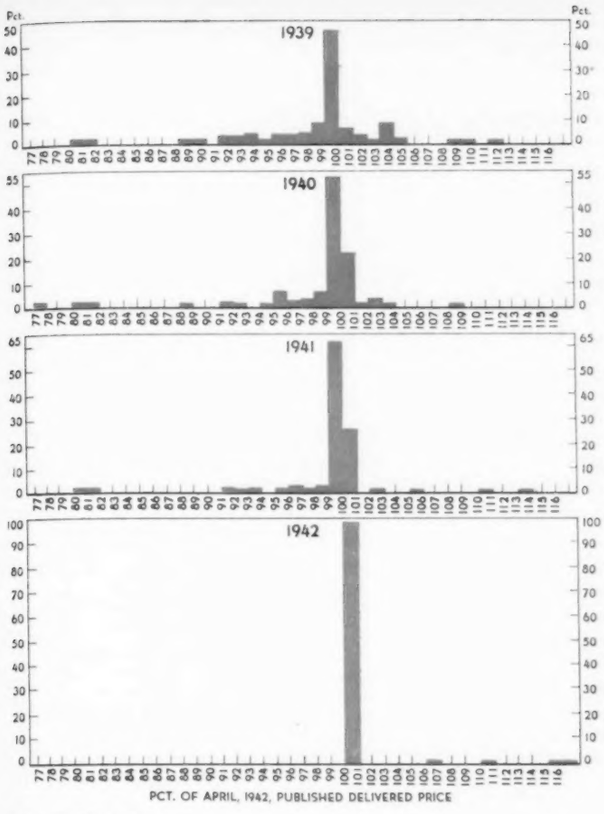

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FIG. 13—MERCHANT BARS: Distribution of delivered invoice prices of steel purchased by consumers as percentages of April 1942 published delivered prices for second quarter, 1939-42.

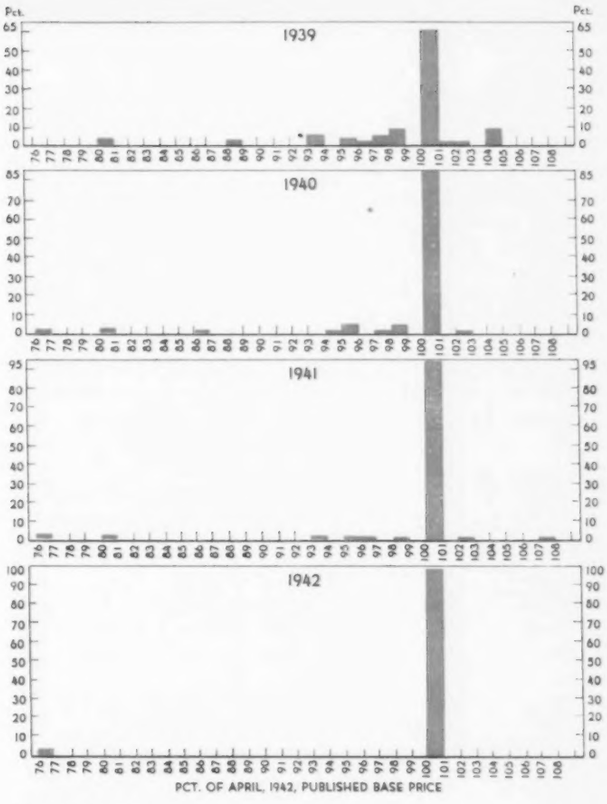

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FIG. 14—MERCHANT BARS: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.

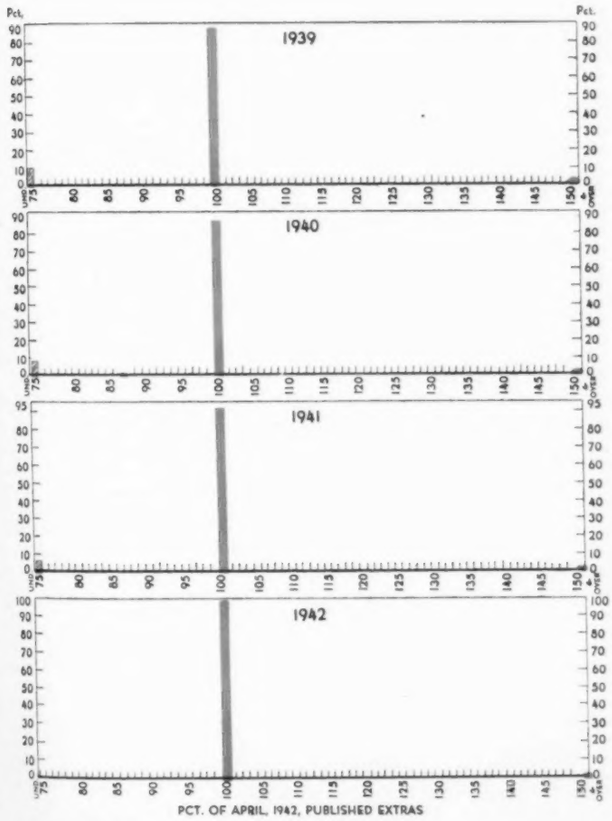

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FIG. 15—MERCHANT BARS: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.

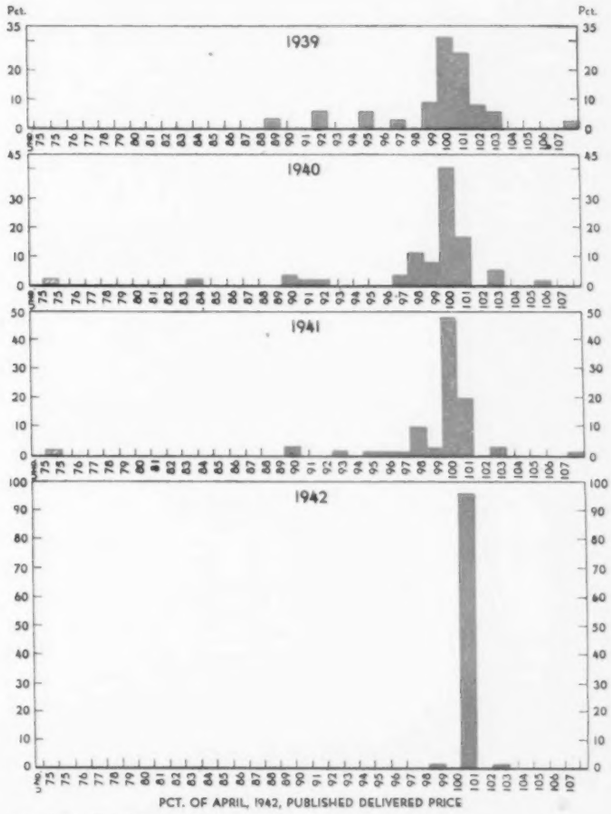

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FIG. 16—COLD-FINISHED BARS: Distribution of delivered invoice prices of steel purchased by consumers as percentages of April 1942 published delivered prices for second quarter, 1939-42.

mills agree that total unit costs decrease as volume increases to the point approaching the physical limit of output.[4] There are several possible explanations. (1) Capacity operation is the result of heavy demand which reduces or eliminates price competition. (2) The time element of delivery becomes the primary consideration of the consumer and price loses some of its importance. In order to obtain delivery on time, consumers may willingly pay the additional freight charges when it is necessary to order from mills outside their normal basing point area. This is dislocated tonnage. (3) In those periods in which mills approach capacity operation, costs, especially labor costs, may be mounting rapidly. Therefore, while, theoretically, a high rate of operation should result in a decreased cost per unit (because of decreasing fixed costs), practically, the factors which tend to accompany high rates of operation may result in increased cost per unit of output.

Base Prices. For lack of information on actual prices, base prices of steel products are commonly used as measures of the price of steel and of the relative price of different steel products. Trade publications, such as THE IRON AGE and *Steel* report base prices regularly, together with weekly, monthly and yearly comparisons as well as indexes to indicate the composite price of finished and semifinished products. The Bureau of Labor Statistics uses certain base prices to represent steel mill products in its wholesale price index.

However, base prices alone are neither good measures of the price of steel nor adequate indicators of the relative prices of different steel products. Prior to 1930 when base prices represented almost the entire price of steel, they fluctuated more than during the past several years, and they indicated the level and trends of prices fairly well. Today, when extras are an important part of the price of steel sometimes more important than the base price itself base prices have lost much of their sensitivity as measures of steel prices. There are instances where products having lower base prices cost more than those having higher base prices when extras have been added. An ex-

TABLE VI—Hot-Rolled Sheets

Distribution of Actual Base Prices of Steel Purchased By Consumers As Percentages of April 1942 Published Base Prices

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1939 Third Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
65.0 – 65.9	1	0.8	1	0.6	..	....	..	....	..	....	..	....
66.0 – 66.9	..	....	..	....	..	....	..	....	..	....	..	....
67.0 – 67.9	..	....	..	....	..	....	..	....	..	....	..	....
68.0 – 68.9	..	....	..	....	..	....	..	....	..	....	..	....
69.0 – 69.9	2	1.6	2	1.2	..	....	..	....	..	....	..	....
70.0 – 70.9	..	....	..	....	..	....	..	....	..	....	..	....
71.0 – 71.9	..	....	1	0.6	..	....	..	....	..	....	..	....
72.0 – 72.9	..	....	1	0.6	..	....	1	0.4	1	0.4	..	....
73.0 – 73.9	..	....	..	....	..	....	..	....	..	....	..	....
74.0 – 74.9	..	....	..	....	..	....	..	....	..	....	..	....
75.0 – 75.9	..	....	..	....	..	....	..	....	..	....	..	....
76.0 – 76.9	15	11.9	51	31.3	3	1.5	..	....	..	....	..	....
77.0 – 77.9	4	3.2	6	3.7	..	....	..	....	..	....	..	....
78.0 – 78.9	..	....	1	0.6	..	....	..	....	..	....	..	....
79.0 – 79.9	2	1.6	..	....	..	....	..	....	4	1.5	5	2.0
80.0 – 80.9	..	....	1	0.6	..	....	..	....	..	....	..	....
81.0 – 81.9	14	11.1	20	12.3	6	3.0	..	....	..	....	..	....
82.0 – 82.9	..	....	..	....	..	....	..	....	..	....	..	....
83.0 – 83.9	2	1.6	5	3.1	3	1.5	..	....	..	....	..	....
84.0 – 84.9	1	0.8	..	....	..	....	..	....	..	....	..	....
85.0 – 85.9	7	5.6	6	3.7	1	0.5	..	....	..	....	..	....
86.0 – 86.9	2	1.6	1	0.6	6	3.0	..	....	..	....	..	....
87.0 – 87.9	..	....	..	....	..	....	..	....	..	....	..	....
88.0 – 88.9	7	5.6	4	2.5	3	1.5	1	0.4	1	0.4	..	....
89.0 – 89.9	..	....	..	....	..	....	..	....	..	....	..	....
90.0 – 90.9	7	5.5	10	6.1	110	54.1	5	2.0	1	0.4	..	....
91.0 – 91.9	..	....	..	....	1	0.5	..	....	..	....	..	....
92.0 – 92.9	3	2.4	5	3.1	4	2.0	6	2.4	..	....	..	....
93.0 – 93.9	..	....	..	....	1	0.5	..	....	..	....	..	....
94.0 – 94.9	5	4.0	11	6.8	..	....	1	0.4	1	0.4	..	....
95.0 – 95.9	24	19.0	25	15.3	8	3.9	8	3.2	7	2.7	1	0.4
96.0 – 96.9	1	0.8	..	....	..	....	..	....	..	....	..	....
97.0 – 97.9	1	0.8	..	....	2	1.0	1	0.4	..	....	..	....
98.0 – 98.9	1	0.8	2	1.2	1	0.5	..	....	..	....	..	....
99.0 – 99.9	..	....	..	....	..	....	..	....	1	0.4	2	0.8
100.0 – 100.9	19	15.0	9	6.1	54	26.5	226	90.4	243	93.8	239	16.8
101.0 – 101.9	..	....	..	....	..	....	..	....	..	....	..	....
102.0 – 102.9	6	4.7	..	....	..	....	..	....	..	....	..	....
103.0 – 103.9	1	0.8	..	....	..	....	..	....	..	....	..	....
104.0 – 104.9	..	....	..	....	..	....	1	0.4	..	....	..	....
105.0 – 105.9	..	....	..	....	..	....	..	....	..	....	..	....
106.0 – 106.9	..	....	..	....	..	....	..	....	..	....	..	....
107.0 – 107.9	1	0.8	..	....	..	....	..	....	..	....	..	....
108.0 – 108.9	..	....	..	....	..	....	..	....	..	....	..	....
109.0 – 109.9	..	....	..	....	..	....	..	....	..	....	..	....
TOTAL	126	100.0	162	100.0	203	100.0	250	100.0	259	100.0	247	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

ample is the case of cold-rolled strip. Cold-rolled strip in April 1942 had a base price of $2.80. Commodity cold-rolled strip had a base price of $2.95. Nevertheless, all size extras applicable to cold-rolled strip are greater than those applicable to commodity cold-rolled strip. Consequently, for the great majority of specifications, cold-rolled strip cost more than commodity cold-rolled strip notwithstanding the lower base price of cold-rolled strip.

Contrary to common belief, the base price does not always represent a popular size or specification of a given product.[5] While this may have been true at one time, this study shows that for many products a very small proportion of purchases or none at all

TABLE VII—Hot-Rolled Sheets

Distribution of Actual Extras on Steel Purchased By Consumers As Percentages of April 1942 Published Extras

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1939 Third Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
0.0 - 0.9	..	....	..	....	1	0.6	1	0.4	1	0.4	1	0.4
1.0 - 49.9	..	....	..	....	2	1.1	1	0.4	..	....	..	....
50.0 - 50.9	..	....	..	....	..	....	1	0.4	..	....	..	....
51.0 - 51.9	..	....	..	....	..	....	..	....	..	....	..	....
52.0 - 52.9	..	....	..	....	..	....	..	....	..	....	..	....
53.0 - 53.9	..	....	..	....	..	....	..	....	..	....	..	....
54.0 - 54.9	..	....	..	....	..	....	..	....	..	....	..	....
55.0 - 55.9	..	....	..	....	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....	..	....	..	....
57.0 - 57.9	..	....	..	....	..	....	..	....	..	....	..	....
58.0 - 58.9	..	....	..	....	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	..	....	..	....	..	....	..	....	..	....
60.0 - 60.9	..	....	..	....	..	....	..	....	..	....	..	....
61.0 - 61.9	..	....	..	....	..	....	..	....	..	....	..	....
62.0 - 62.9	..	....	1	0.7	2	1.1	2	0.8	2	0.8	..	....
63.0 - 63.9	..	....	..	....	..	....	..	....	..	....	..	....
64.0 - 64.9	..	....	..	....	..	....	..	....	..	....	..	....
65.0 - 65.9	..	....	..	....	..	....	..	....	..	....	..	....
66.0 - 66.9	1	0.9	1	0.7	1	0.6	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	..	....	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	..	....	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	..	....	1	0.6	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	1	0.7	..	....	..	....	..	....	..	....
80.0 - 80.9	2	1.8	3	2.0	..	....	..	....	..	....	..	....
81.0 - 81.9	2	1.8	2	1.4	1	0.6	1	0.5	1	0.4	1	0.5
82.0 - 82.9	..	....	1	0.7	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	2	1.8	3	2.0	1	0.5	2	0.9	1	0.4	..	....
86.0 - 86.9	..	....	1	0.7	..	....	..	....	..	....	1	0.5
87.0 - 87.9	1	0.9	..	....	1	0.5	..	....	..	....	..	....
88.0 - 88.9	..	....	..	....	..	....	..	....	1	0.4	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....	..	....	..	....
92.0 - 92.9	..	....	..	....	2	1.1	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	1	0.5	1	0.5	1	0.4	..	....
94.0 - 94.9	..	....	..	....	..	....	..	....	..	....	..	....
95.0 - 95.9	..	....	1	0.7	..	....	..	....	..	....	..	....
96.0 - 96.9	..	....	3	2.0	..	....	..	....	..	....	..	....
97.0 - 97.9	2	1.8	3	2.0	..	....	..	....	..	....	..	....
98.0 - 98.9	1	0.9	1	0.7	5	2.7	..	....	..	....	..	....
99.0 - 99.9	..	....	2	1.3	2	1.1	2	0.8	1	0.5	..	....
100.0 - 100.9	91	82.0	119	80.9	162	89.0	212	94.6	226	96.1	221	98.6
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	1	0.9	..	....	..	....	1	0.5	1	0.5	..	....
107.0 - 107.9	1	0.9	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	1	0.9	1	0.7	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....	..	....
110.0 - 110.9	..	....	..	....	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	..	....	..	....	..	....	..	....
112.0 - 112.9	4	3.6	2	1.4	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....	..	....
115.0 - 115.9	1	0.9	1	0.7	..	....	..	....	..	....	..	....
116.0 - 116.9	1	0.9	1	0.7	..	....	..	....	..	....	..	....
117.0 - 117.9	..	....	..	....	..	....	..	....	..	....	..	....
118.0 - 118.9	..	....	..	....	..	....	..	....	..	....	..	....
119.0 - 119.9	..	....	..	....	..	....	..	....	..	....	..	....
TOTAL	111	100.0	147	100.0	182	100.0	224	100.0	235	100.0	224	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

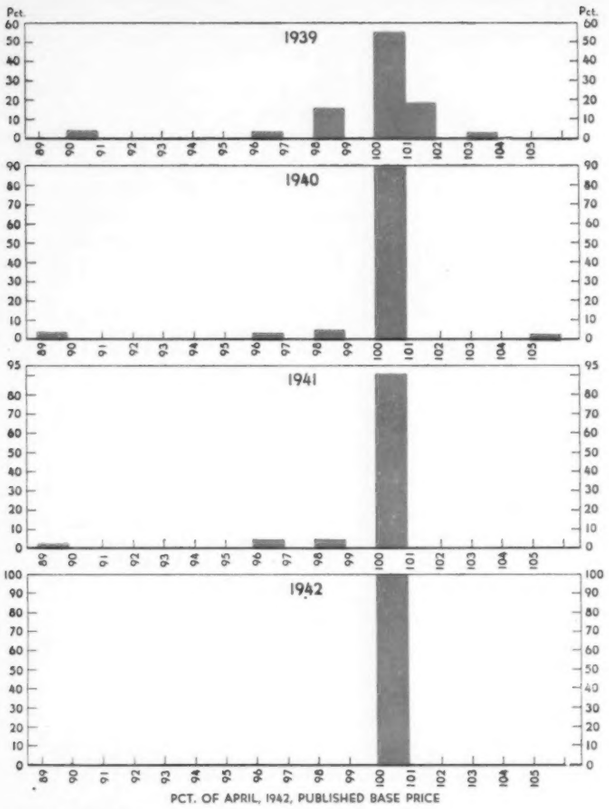

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FIG. 17—COLD-FINISHED BARS: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.

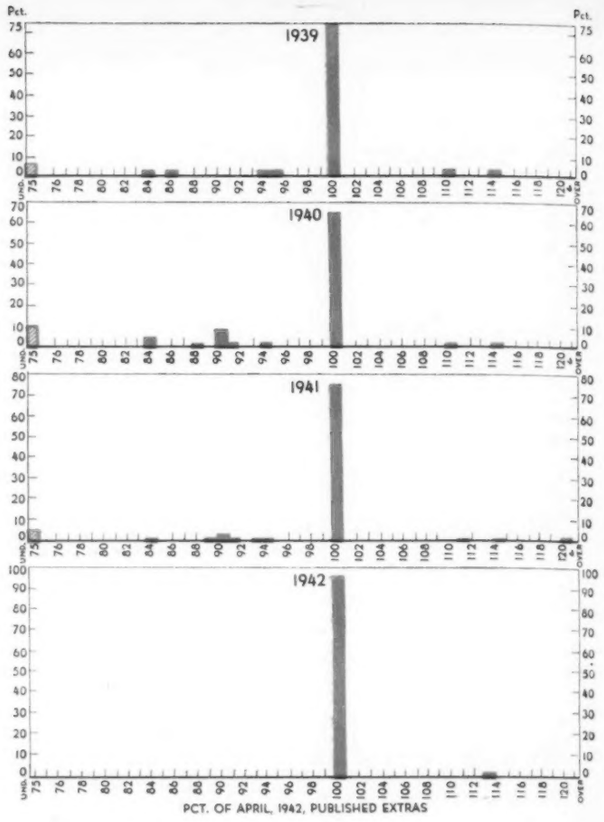

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FIG. 18—COLD-FINISHED BARS: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.

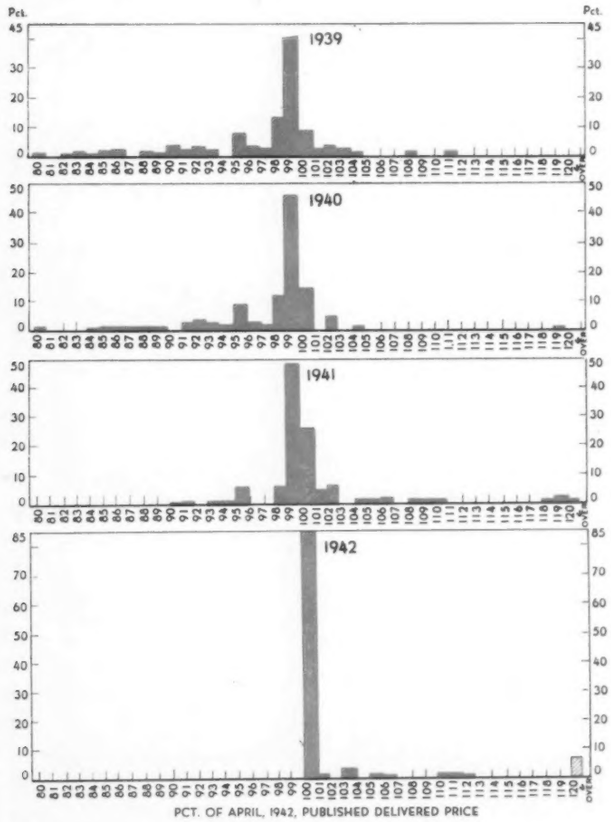

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FIG. 19—PLATES: Distribution of delivered invoice prices of steel purchased by consumers as percentages of April 1942 published delivered prices for second quarter, 1939-42.

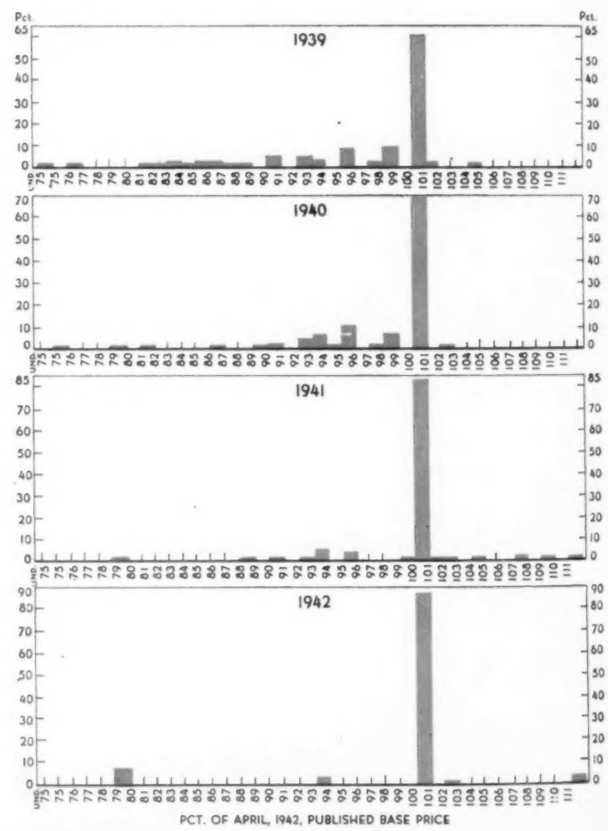

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FIG. 20—PLATES: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.

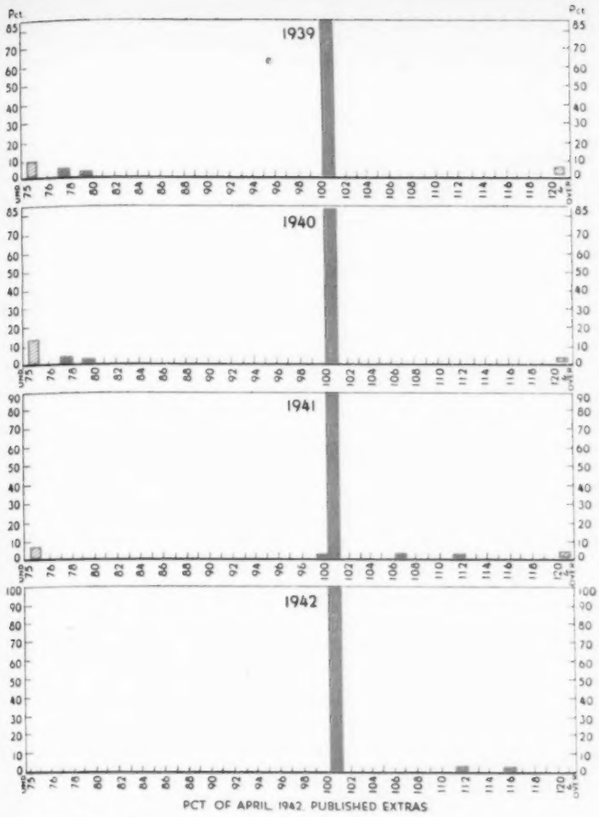

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FIG. 21—PLATES: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.

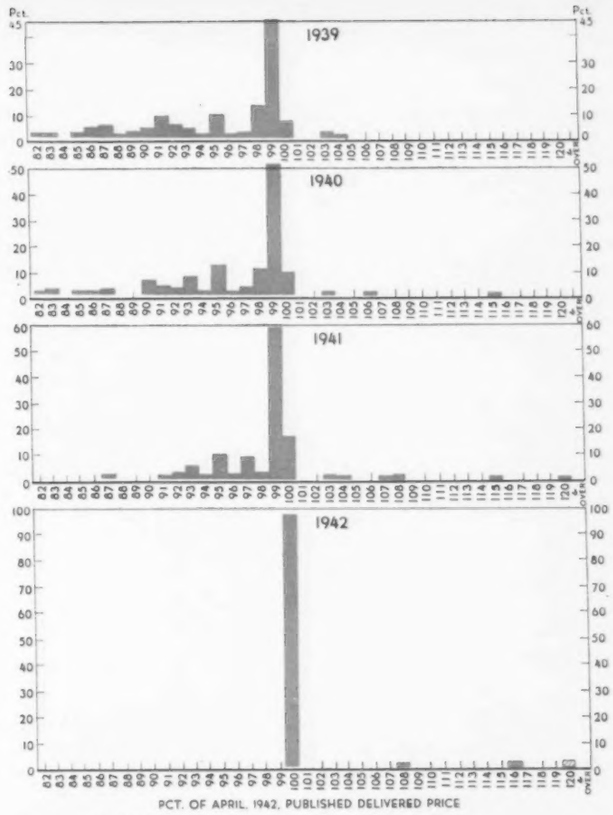

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FIG. 22—STRUCTURAL SHAPES: Distribution of delivered invoice prices of steel purchased by consumers as percentages of April 1942 published delivered prices for second quarter, 1939-42.

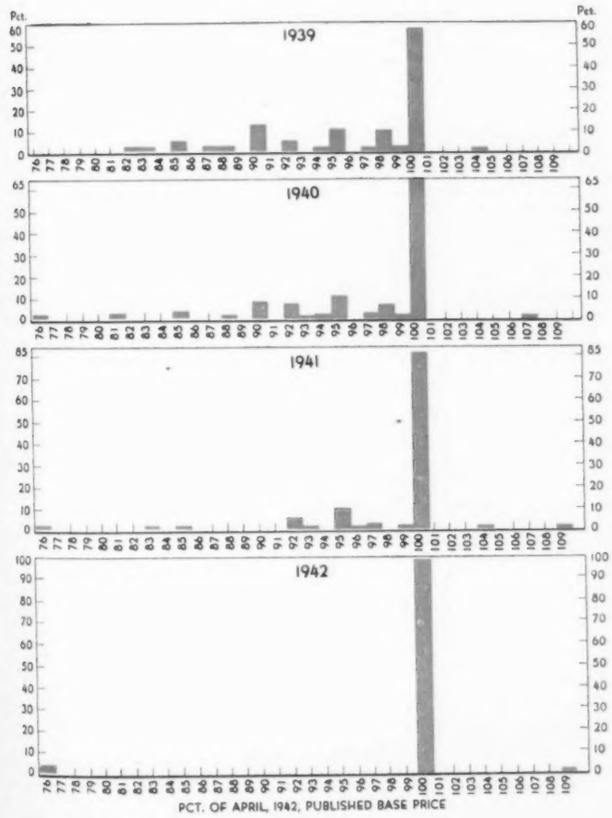

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FIG. 23—STRUCTURAL SHAPES: Distribution of actual base prices of steel purchased by consumers as percentages of April 1942 published base prices for second quarter, 1939-42.

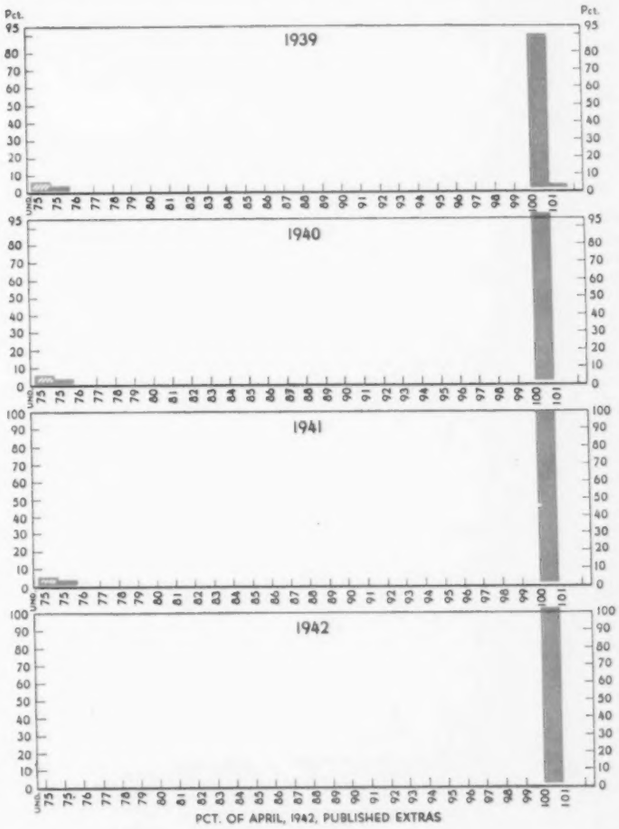

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FIG. 24—STRUCTURAL SHAPES: Distribution of actual extras on steel purchased by consumers as percentages of April 1942 published extras for second quarter, 1939-42.

TABLE VIII—Cold-Rolled Sheets—Distribution of Delivered Invoice Prices of Steel Purchased by Consumers As Percentages of April 1942 Published Delivered Prices
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	1	2.1	..	....	1	1.4	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	1	3.6	..	....	..	....	..	....	..	....
87.0 - 87.9	4	14.3	..	....	..	....	..	....	..	....
88.0 - 88.9	2	7.1	..	....	..	....	..	....	..	....
89.0 - 89.9	1	3.6	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	1	2.1	..	....	..	....	..	....
91.0 - 91.9	2	7.1	..	....	..	....	..	....	..	....
92.0 - 92.9	3	10.7	3	6.4	1	1.5	..	....	..	....
93.0 - 93.9	2	7.1	21	44.7	..	....	..	....	..	....
94.0 - 94.9	1	3.6	10	21.4	1	1.5	..	....	..	....
95.0 - 95.0	..	....	1	2.1	..	....	..	....	..	....
96.0 - 96.9	2	7.1	1	2.1	4	5.9	4	5.8	1	1.6
97.0 - 97.9	..	....	..	....	2	2.9	1	1.4	1	1.6
98.0 - 98.9	3	10.7	..	....	..	....	..	....	..	....
99.0 - 99.9	4	14.4	5	10.6	41	60.3	39	56.5	..	....
100.0 - 100.9	2	7.1	4	8.5	19	27.9	21	30.4	57	93.6
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	1	1.6
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	1	3.6	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	1	1.5	..	....
110.0 - 110.9	..	....	..	....	..	....	1	1.5	..	....
111.0 - 111.9	..	....	..	....	..	....	1	1.5	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	1	1.6
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....
TOTAL	28	100.0	47	100.0	68	100.0	69	100.0	61	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

TABLE IX—Cold-Rolled Sheets—Distribution of Actual Base Prices of Steel Purchased by Consumers As Percentages of April 1942 Published Base Prices
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	1	4.0	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	1	1.5	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	1	1.5	1	1.7
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	6	24.0	1	2.3	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	..	....	..	....	..	....	..	....	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....	..	....
90.0 - 90.9	1	4.0	2	4.7	..	....	..	....	..	....
91.0 - 91.9	3	12.0	1	2.3	..	....	..	....	..	....
92.0 - 92.9	..	....	..	....	..	....	..	....	..	....
93.0 - 93.9	1	4.0	29	67.5	..	....	..	....	..	....
94.0 - 94.9	..	....	..	....	..	....	..	....	..	....
95.0 - 95.9	2	8.0	..	....	1	1.6	..	....	..	....
96.0 - 96.9	..	....	1	2.3	2	3.1	2	3.1	..	....
97.0 - 97.9	..	....	..	....	1	1.6	1	1.5	..	....
98.0 - 98.9	3	12.0	1	2.3	1	1.6	1	1.5	..	....
99.0 - 99.9	..	....	..	....	..	....	..	....	..	....
100.0 - 100.9	7	28.0	8	18.6	59	92.1	60	90.9	57	96.6
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....	1	1.7
104.0 - 104.9	1	4.0	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....
TOTAL	25	100.0	43	100.0	64	100.0	66	100.0	59	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

is made at the base price. This proportion varies among products approximately as follows:

Product	Pct of Purchases Made at Base Price	Pct of Purchases Requiring Extras
Semifinished	30	70
Merchant bars	29	71
Cold-finished bars	0	100
Plates	60	40
Structural shapes	66	34
Hot-rolled sheets	8	92
Cold-rolled sheets	0	100
Hot-rolled strip	0	100
Cold-rolled strip	0	100
Tinplate	9	91
Terneplate	5	95
Blackplate	0	100
Rails and accessories	25	75
Wire and wire products	14	86
Alloys	0	100

Base prices, although commonly used to represent wholesale prices of steel products, are not the prices at which actual transactions take place. In the case of the eight products studied, the base price varied from 60 to 90 pct of the delivered price, as shown in table II. Base prices paid for merchant bars, cold-rolled sheets, plates and structural shapes represented a large part of their delivered prices from 87 to 90 pct. Base prices paid for cold-rolled strip, cold-finished bars, hot-rolled sheets, and hot-rolled strip, however, represented only 60 to 75 pct of their delivered prices.

Extras. Although the base price is usually the most important component of the delivered price, during the past decade extras have become an increasingly significant factor. Between 1933 and 1943, the extras applicable to steel products increased rapidly both in number and complexity. As extras became a more important part of the delivered price and the stability

TABLE X—Cold-Rolled Sheets
Distribution of Actual Extras on Steel Purchased by Consumers As Percentages of April, 1942, Published Extras
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number o : Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
0.0 - 0.9	1	4.0	1	2.3	..	....	..	....	..	....
1.0 - 49.9	..	....	..	....	2	3.1	2	3.1	2	3.4
50.0 - 50.9	..	....	..	....	..	....	..	....	..	....
51.0 - 51.9	..	....	..	....	..	....	..	....	..	....
52.0 - 52.9	..	....	..	....	..	....	..	....	..	....
53.0 - 53.9	..	....	..	....	..	....	..	....	..	....
54.0 - 54.9	..	....	..	....	..	....	..	....	..	....
55.0 - 55.9	..	....	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....	..	....
57.0 - 57.9	..	....	..	....	..	....	..	....	..	....
58.0 - 58.9	..	....	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	..	....	..	....	..	....	..	....
60.0 - 60.9	..	....	1	2.4	1	1.5	1	1.5	..	....
61.0 - 61.9	..	....	..	....	..	....	..	....	..	....
62.0 - 62.9	..	....	..	....	..	....	..	....	..	....
63.0 - 63.9	..	....	..	....	..	....	..	....	..	....
64.0 - 64.9	..	....	..	....	..	....	..	....	..	....
65.0 - 65.9	..	....	..	....	..	....	..	....	..	....
66.0 - 66.9	..	....	..	....	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....
82.9 - 82.9	..	....	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	1	1.5	..	....	..	....
88.0 - 88.9	..	....	..	....	..	....	..	....	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....	..	....
90.9 - 90.9	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....	..	....
92.0 - 92.9	..	....	..	....	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	..	....	..	....	..	....
94.0 - 94.9	..	....	..	....	..	....	..	....	..	....
95.0 - 95.9	..	....	..	....	..	....	..	....	..	....
96.0 - 96.9	1	4.0	1	2.3	..	....	..	....	..	....
97.0 - 97.9	1	4.0	4	9.3	..	....	..	....	..	....
98.0 - 98.9	2	8.0	4	9.3	..	....	..	....	..	....
99.0 - 99.9	1	4.0	..	....	..	....	..	....	..	....
100.0 - 100.9	19	76.0	32	4.4	60	93.9	62	93.9	57	96.6
101.0 - over	..	....	..	....	..	....	1	1.5	..	....
TOTAL	25	100.0	43	100.0	64	100.0	66	100.0	59	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

of base prices grew, base prices lost much of their reliability as barometers of steel prices.

Comparison of the types of extras as well as their price ranges applicable to structural shapes in 1917, 1925, 1933 and 1940-43 is given in table III. There were only two types of extras applicable to structural shapes in 1917. These grew in number to five in 1925, seven in 1933, and 18 in 1940. Table IV shows that extras applicable to hot-rolled strip increased from nine in 1933 to 16 in 1939.

In the case of the eight products studied, extras varied from 1.5 to 35 pct of the delivered price. Extras paid for merchant bars, cold-rolled sheets, plates and structural shapes represented a very small part of their delivered price, from 1.5 to 6 pct. Extras paid for cold-rolled strip, cold-finished bars, hot-rolled sheets, and hot-rolled strip constituted an important part of their delivered price, from 18 to 35 pct.

Freight. The cost of freight averaged about 7 pct of the delivered price. Although the ratio of freight to delivered price of the eight products varied from 5 to 10 pct, the variation is more dependent upon the amount of the delivered price than the amount of the freight. Those products having a low delivered price have a high freight ratio; those products having a high delivered price have a low freight ratio.

Freight costs increased for a large percentage of the purchases made during the period surveyed. There was a general 6 pct increase in freight rates effective Mar. 18, 1942. However, there were numerous increases of more than 6 pct which were due to changes in basing points from those nearest the consumers to those nearest the mills or to an f.o.b. mill basis.

In 1939, when competition was keen, the basing point used was that nearest the consumer; in some instances all the freight was absorbed by the mills; prices charged were notably lower than called for by the basing point formula. In 1941 and 1942, when the mills operated at 97 pct of capacity and competition had disappeared, actual prices exceeded published prices when the mills changed from basing points nearest the consumer to those nearest the mills or to an f.o.b. mill basis.

The delivered price of steel was increased as much as 50 pct in some instances, particularly for Pacific Coast consumers because of higher freight costs resulting from changes in basing points. Use of Pacific Coast ports as basing points presumes shipment from Midwestern or Eastern mills by a combination of water-rail freight. With the closing of the Panama Canal to commercial traffic, this method of transportation was no longer available, and consumers in the Pacific area were forced to pay all-rail freight from mills.

Use of Concessions. In competitive periods, when the mills do not operate at or near capacity, actual prices tend to vary considerably from published prices because of concessions from published prices granted to consumers. In 1939 and 1940, when steel mills operated at an average of 65 and 82 pct of capacity, respectively,[6] consumers received concessions through the waiving of certain extras, reduction in base prices, downgrading, special quantity discounts, and by quoting prices which had no logical basis except to meet competition.

By the second quarter of 1941, when the mills oper-

TABLE XI—Hot Rolled Strip—Distribution of Delivered Invoice Prices of Steel Purchased by Consumers as Percentages of April 1942 Published Delivered Prices Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
75.0 - 75.9	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....
77.0 - 77.9	1	3.2	..	....	..	....	..	....
78.0 - 78.9	2	6.5	..	....	..	....	..	....
79.0 - 79.9	2	6.5	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....
81.0 - 81.9	3	9.7	1	2.0	1	1.6	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....
83.0 - 83.9	1	3.2	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....
85.0 - 85.9	1	3.2	..	....	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....
88.0 - 88.9	1	3.2	..	....	..	....	..	....
89.0 - 89.9	1	3.2	..	....	..	....	..	....
90.0 - 90.9	1	3.2	4	8.2	..	....	..	....
91.0 - 91.9	..	....	6	12.3	..	....	..	....
92.0 - 92.9	1	3.2	12	24.5	..	....	..	....
93.0 - 93.9	..	....	4	8.2	1	1.6	..	....
94.0 - 94.9	1	3.2	3	6.1	1	1.6	1	1.7
95.0 - 95.9	6	19.4	3	6.1	..	....	..	....
96.0 - 96.9	1	3.2	1	2.0	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....
98.0 - 98.9	..	....	..	....	..	....	..	....
99.0 - 99.9	3	9.7	9	18.4	37	59.7	..	....
100.0 - 100.9	2	6.5	4	8.2	19	30.7	58	98.3
101.0 - 101.9	4	12.9	..	....	2	3.2	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....
103.0 - 103.9	..	....	1	2.0	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	1	1.6	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....
TOTAL	31	100.0	49	100.0	62	100.0	59	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

TABLE XII—Hot-Rolled Strip—Distribution of Actual Base Prices of Steel Purchased by Consumers As Percentages of April 1942 Published Base Prices
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
70.0 - 70.9	..	....	..	....	..	....	..	....
71.0 - 71.9	1	3.5	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	1	2.0	1	1.6	..	....
76.0 - 76.9	7	24.1	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....
81.0 - 81.9	1	3.5	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....
85.0 - 85.9	3	10.3	1	2.0	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....
88.0 - 88.9	..	....	1	2.0	..	....	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....
90.0 - 90.9	1	3.5	27	55.1	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....
92.0 - 92.9	3	10.3	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	..	....	..	....
94.0 - 94.9	..	....	1	2.0	1	1.6	..	....
95.9 - 95.9	6	20.7	2	4.1	..	....	1	1.7
96.0 - 96.9	..	....	..	....	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....
98.0 - 98.9	..	....	..	....	..	....	..	....
99.0 - 99.9	..	....	..	....	32	51.6	..	....
100.0 - 100.9	2	6.9	12	24.5	25	40.3	58	98.3
101.0 - 101.9	..	....	..	....	..	....	..	....
102.0 - 102.9	4	13.8	1	2.1	2	3.3	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....
107.0 - 107.9	1	3.4	1	2.1	1	1.6	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	1	2.1	..	....	..	....
TOTAL	29	100.0	48	100.0	62	100.0	59	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

ated at or near capacity and competition had disappeared, actual prices paid for most steel products closely approximated published prices and have remained stable since that time. The mills had removed most price concessions, had introduced new extras. enforced more rigid interpretation and use of published extras, and in an increasing number of instances were changing basing points from those nearest the consumer to those nearest the mill.

The extent of price concessions shown by this study is probably understated because certain very large consumers in the automobile and container industries were excluded from the survey. This omission was at the request of the OPA which contemplated obtaining this information in connection with other studies. Since a small percentage of steel consumers, including these companies, accounts for a large percentage of steel purchased, prices paid by a relatively few large consumers have an important influence upon the entire steel price structure. Very large steel consumers get greater reductions from published prices than smaller consumers, often the result of competitive bidding by the mills for the large volume of steel involved. One very large steel consumer, a firm that purchased over 2 pct of the total consumption of hot and cold-rolled sheets in 1940, refused to give purchase prices. This firm wished to protect its suppliers, fearing that "certain transactions might be revealed which would break confidence" with the steel mills. However, this company did furnish percent changes of prices paid for several steel products which showed that for some products prices advanced markedly, and in one case, nearly 50 pct. The great price advances for this company indicate that it was receiving much larger concessions than smaller buyers.

With few exceptions prices obtained do not reflect concessions in the form of year end volume rebates or other special pricing arrangements agreed upon with the steel mills. Naturally, steel consumers are reluctant to disclose such special pricing arrangements lest they break confidence with their suppliers and be denied concessions after the war.

In view of the limitations outlined, certain important deviations of actual prices paid from the published prices are not reflected in the data. Consequently, although it appears that, at present, concessions from published prices are at a minimum or in most cases nonexistent, it is likely that the average of actual prices paid by carlot steel consumers prior to the second quarter of 1942 was lower than the data indicated.

Hot-Rolled Sheets. Prices actually paid for hot-rolled sheets as shown by purchase invoices, increased in a number of cases by as much as 25 to 30 pct from the second quarter of 1939 to the second quarter of 1942, and in one case by 41 pct from August 1939 to April 1942. Published prices throughout the period remained nearly constant. Published base prices at

Eastern and Midwestern basing points went from $2.15 per 100 lb in April 1939 to $2.00 in June 1939, and then advanced from $2.00 to $2.10 in December 1939 and remained there throughout the period to April 1942 with one exception. In April 1940 the price fell to $1.90 but in May rose again to $2.10. See table XXIX. The published extras which applied in April 1942 had been in effect since Nov. 28, 1939.[7] A 6 pct increase on rail freight rates became effective on Mar. 18, 1942, and this resulted in a slight increase in delivered prices.

The average percentages of invoice prices to April 1942, published prices were as follows: Second quarter 1939, 92 pct; third quarter 1939, 85 pct; second quarter 1940, 94 pct; second quarter 1941, 99 pct; fourth quarter 1942, 100 pct, and second quarter 1942, 101 pct. These percentages indicate a marked increase in prices from the second quarter of 1939 to the second quarter of 1942. Price increases from one quarter to another cannot be measured exactly for this or the succeeding seven products because the number of purchases represented varies slightly from period to period. Some consumers did not purchase a selected specification as often as once each quarter.

Variations of invoice prices from April 1942 published prices in the selected quarters were:

Variations of Invoice Prices of Hot-Rolled Sheets From April 1942 Published Prices Selected Quarters 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939	137	79	9	12
3rd quarter 1939	178	96	4	0
2nd quarter 1940	210	78	22	0
2nd quarter 1941	253	15	85	Less than 1%
4th quarter 1941	259	7	90	3
2nd quarter 1942	251	2	96	2

* Excluding variation caused by 6 pct rail rate increase, Mar. 18, 1942.

TABLE XIII—Hot-Rolled Strip

Distribution of Actual Extras on Steel Purchased by Consumers As Percentages of April 1942 Published Extras Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
1.0 - 49.9	..	....	..	....	1	1.6	..	....
50.0 - 50.9	..	....	..	....	..	....	..	....
51.0 - 51.9	..	....	..	....	..	....	..	....
52.0 - 52.9	..	....	..	....	..	....	..	....
53.0 - 53.9	..	....	..	....	..	....	..	....
54.0 - 54.9	..	....	..	....	..	....	..	....
55.0 - 55.9	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....
57.0 - 57.9	1	3.4	1	2.1	1	1.6	1	1.7
58.0 - 58.9	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	..	....	..	....	..	....
60.0 - 60.9	..	....	1	2.1	..	....	..	....
61.0 - 61.9	..	....	..	....	..	....	..	....
62.0 - 62.9	..	....	..	....	..	....	..	....
63.0 - 63.9	..	....	..	....	..	....	..	....
64.0 - 64.9	..	....	..	....	..	....	..	....
65.0 - 65.9	..	....	..	....	..	....	..	....
66.0 - 66.9	..	....	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	1	2.1	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....
88.0 - 88.9	..	....	..	....	..	....	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....
92.0 - 92.9	..	....	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	..	....	..	....
94.0 - 94.9	..	....	..	....	..	....	..	....
95.9 - 95.0	..	....	..	....	..	....	..	....
96.0 - 96.9	..	....	..	....	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....
98.0 - 98.9	..	....	..	....	..	....	..	....
99.0 - 99.9	..	....	..	....	..	....	..	....
100.0 - 100.9	28	96.6	45	93.7	60	96.8	58	98.3
TOTAL	29	100.0	48	100.0	62	100.0	59	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

Fig. 1, and table V show that in the second quarter of 1939 invoice prices ranged from 77 to 106 pct of April 1942 published prices, with one fourth of the purchases under 85 pct, and one half ranging from 77 to 93 pct. By the second quarter of 1940, over half the purchases were in the group ranging from 90 to 95 pct, and by the second quarter of 1942 practically all dispersion had disappeared, with 96 pct of purchases made at published prices. By the second quarter of 1941, when price ceilings were set, most of the increases had occurred, and invoice prices neared or equaled April 1942 published prices. Invoice prices higher than published prices, however, were already being paid as a result of dislocated tonnage. The high percentage of purchases made at between 99.0 and 99.9 pct of April 1942 published prices, prior to the second quarter of 1942, reflects the 6 pct change in freight rates which was not in effect during the earlier periods studied.

Of the 251 purchases reported in the second quarter

TABLE XIV—Cold-Rolled Strip

Distribution of Delivered Invoice Prices of Steel Purchased by Consumers as Percentages of April 1942 Published Delivered Prices

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 First Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
55.0 - 55.9	..	....	..	....	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....	..	....	..	....
57.0 - 57.9	..	....	..	....	..	....	..	....	..	....	..	....
58.0 - 58.9	..	....	..	....	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	1	2.1	..	....	..	....	..	....	..	....
60.0 - 60.9	..	....	..	....	..	....	..	....	..	....	..	....
61.0 - 61.9	..	....	..	....	1	1.6	..	....	..	....	..	....
62.0 - 62.9	..	....	..	....	..	....	..	....	..	....	..	....
63.0 - 63.9	1	2.6	..	....	..	....	..	....	..	....	..	....
64.0 - 64.9	..	....	..	....	..	....	..	....	..	....	..	....
65.0 - 65.9	..	....	..	....	..	....	..	....	..	....	..	....
66.0 - 66.9	..	....	..	....	..	....	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	1	2.1	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	1	2.1	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	1	2.1	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	1	2.1	1	1.6	1	1.8	1	1.8	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	1	2.5	1	2.1	2	3.1	1	1.8	..	....	..	....
75.0 - 75.9	..	....	1	2.1	1	1.6	..	....	..	....	..	....
76.0 - 76.9	2	5.1	..	....	1	1.6	1	1.8	1	1.8	..	....
77.0 - 77.9	1	2.6	..	....	1	1.6	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	1	1.6	1	1.8	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	3	7.7	1	2.1	1	1.6	..	....	..	....	..	....
82.0 - 82.9	1	2.6	2	4.1	1	1.6	1	1.8	..	....	..	....
83.0 - 83.9	1	2.6	1	2.0	2	3.2	..	....	..	....	..	....
84.0 - 84.9	3	7.7	3	6.1	2	3.2	2	3.5	..	....	..	....
85.0 - 85.9	..	....	1	2.0	1	1.6	..	....	..	....	..	....
86.0 - 86.9	..	....	1	2.0	1	1.6	..	....	..	....	..	....
87.0 - 87.9	1	2.5	1	2.0	1	1.6	..	....	..	....	..	....
88.0 - 88.9	1	2.5	1	2.0	..	....	..	....	..	....	..	....
89.0 - 89.9	1	2.5	1	2.0	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	2	5.1	..	....	1	1.6	1	1.8	1	1.8	..	....
92.0 - 92.9	..	....	..	....	3	4.8	2	3.5	..	....	..	....
93.0 - 93.9	..	....	3	6.1	2	3.1	1	1.8	1	1.8	..	....
94.0 - 94.9	3	7.7	3	6.1	2	3.1	..	....	..	....	..	....
95.0 - 95.9	3	7.7	5	10.2	..	....	1	1.8	1	1.8	1	2.2
96.0 - 96.9	..	....	1	2.0	2	3.1	2	3.6	..	....	..	....
97.0 - 97.9	5	12.8	..	....	1	1.6	..	....	1	1.8	..	....
98.0 - 98.9	2	5.1	2	4.1	..	....	..	....	..	....	..	....
99.0 - 99.9	1	2.6	13	26.5	25	39.7	33	58.9	33	60.0	..	....
100.0 - 100.9	..	....	..	....	7	11.1	6	10.7	10	18.2	41	91.2
101.0 - 101.9	1	2.6	1	2.0	..	....	..	....	..	....	..	....
102.0 - 102.9	4	10.3	1	2.0	..	....	..	....	..	....	..	....
103.0 - 103.9	1	2.6	1	2.0	..	....	..	....	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	1	1.6	1	1.8	1	1.8	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	1	2.6	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	1	1.6	1	1.8	..	....	..	....
110.0 - 110.9	..	....	..	....	..	....	..	....	1	1.9	1	2.2
111.0 - 111.9	..	....	..	....	..	....	..	....	..	....	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	1	1.8	1	2.2
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....	..	....
115.0 - 115.9	..	....	..	....	..	....	..	....	..	....	..	....
116.0 - 116.9	..	....	..	....	..	....	..	....	..	....	..	....
117.0 - 117.9	..	....	..	....	..	....	..	....	2	3.7	1	2.2
118.0 - 118.9	..	....	..	....	..	....	..	....	..	....	..	....
119.0 - 119.9	..	....	..	....	..	....	..	....	..	....	..	....
120.0 - 120.9	..	....	..	....	..	....	..	....	..	....	..	....
121.0 - 121.9	..	....	..	....	..	....	..	....	..	....	..	....
122.0 - 122.9	..	....	..	....	..	....	..	....	..	....	..	....
123.0 - 123.9	..	....	..	....	..	....	..	....	..	....	..	....
124.0 - 124.9	..	....	..	....	1	1.6	1	1.8	1	1.8	..	....
TOTAL	39	100.0	49	100.0	63	100.0	56	100.0	55	100.0	45	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

TABLE XV
PLATES—UNIVERSAL AND SHEARED

Distribution of Actual Extras on Steel Purchased by Consumers As Percentages of April 1942 Published Extras Selected Quarters 1939-42 (on p. 145B this information for cold-rolled strip is tabulated).

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
0.0 - 0.9					2	2.5				
1.0 - 49.9	1	1.9	1	1.5	1	1.2				
50.0 - 50.9			1	1.5						
51.0 - 51.9										
52.0 - 52.9										
53.0 - 53.9										
54.0 - 54.9					1	1.2				
55.0 - 55.9										
56.0 - 56.9										
57.0 - 57.9										
58.0 - 58.9										
59.0 - 59.9										
60.0 - 60.9			1.	1.4						
61.0 - 61.9										
62.0 - 62.9										
63.0 - 63.9	1	1.9	1	1.4						
64.0 - 64.9	1	1.9	1	1.4						
65.0 - 65.9										
66.0 - 66.9	2	3.7	3	4.3						
67.0 - 67.9										
68.0 - 68.9										
69.0 - 69.9										
70.0 - 70.9					1	1.2				
71.0 - 71.9			1	1.4						
72.0 - 72.9										
73.0 - 73.9										
74.0 - 74.9										
75.0 - 75.9										
76.0 - 76.9										
77.0 - 77.9	2	3.7	2	2.9						
78.0 - 78.9										
79.0 - 79.9	1	1.8	1	1.4						
80.0 - 80.9										
81.0 - 81.9										
82.0 - 82.9										
83.0 - 83.9										
84.0 - 84.9										
85.0 - 85.9										
86.0 - 86.9										
87.0 - 87.9										
88.0 - 88.9										
89.0 - 89.9										
90.0 - 90.9										
91.0 - 91.9										
92.0 - 92.9										
93.0 - 93.9										
94.0 - 94.9										
95.0 - 95.9										
96.0 - 96.9										
97.0 - 97.0										
98.0 - 98.9										
99.0 - 99.9					1	1.2				
100.0 - 100.9	44	81.5	57	81.4	71	87.7	76	95.0	72	97.3
101.0 - 101.9										
102.0 - 102.9										
103.0 - 103.9										
104.0 - 104.9										
105.0 - 105.9										
106.0 - 106.9					1	1.3				
107.0 - 107.9										
108.0 - 108.9										
109.0 - 109.9										
110.0 - 110.9										
111.0 - 111.9					1	1.3	1	1.2	1	1.4
112.0 - 112.9										
113.0 - 113.9										
114.0 - 114.9										
115.0 - 115.9							1	1.2	1	1.3
116.0 - 116.9										
117.0 - 117.9										
118.0 - 118.9										
119.0 - 119.9										
120.0 - 120.9	1	1.8			1	1.2	1	1.3		
121.0 - 121.9										
122.0 - 122.9										
123.0 - 123.9										
124.0 - 124.9										
125.0 - 125.9										
126.0 - 126.9										
127.0 - 127.9										
128.0 - 128.9										
129.0 - 129.9										
130.0 - 130.9										
131.0 - 131.9										
132.0 - 132.9										
133.0 - 133.9							1	1.3		
134.0 - 134.9										
135.0 - over	1	1.8	1	1.4	1	1.2				
TOTAL	54	100.0	70	100.0	81	100.0	80	100.0	74	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

of 1942, six purchases or 2 pct were made at more than published prices. These six instances do not indicate violations of ceiling prices. They are examples of increases in delivered prices due to dislocated tonnage, or cases where the consumer paid freight from the steel mill or from the basing point nearest the mill instead of from the basing point nearest his own plant. Of the six cases, five were in the Pacific area and reflect delivered prices based on Eastern basing points and all-rail freight charged to Pacific Coast ports instead of prices based on Pacific Coast port basing points which presume shipment by

TABLE XVI—Cold-Rolled Strip

Distribution of Actual Extras on Steel Purchased by Consumers as Percentages of April 1942 Published Extras
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 First Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
Less than 0.0	1	3.1	1	2.4	1	1.8	1	2.0	..	....	..	....
0.0 - 0.9	..	....	..	....	..	....	..	....	..	....	..	....
1.0 - 48.9	8	25.0	10	23.7	10	18.5	5	9.8	1	2.0	..	....
50.0 - 50.9	..	....	..	....	..	....	..	....	..	....	..	....
51.0 - 51.9	..	....	..	....	..	....	..	....	..	....	..	....
52.0 - 52.9	..	....	..	....	..	....	..	....	..	....	..	....
53.0 - 53.9	..	....	..	....	..	....	..	....	..	....	..	....
54.0 - 54.9	..	....	..	....	..	....	..	....	..	....	..	....
55.0 - 55.9	..	....	..	....	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....	..	....	..	....
57.0 - 57.9	..	....	1	2.4	1	1.8	1	2.0	1	2.0	..	....
58.0 - 58.9	1	3.1	..	....	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	..	....	..	....	..	....	..	....	..	....
60.0 - 60.9	1	3.1	1	2.4	2	3.7	1	2.0	..	....	..	....
61.0 - 61.9	..	....	..	....	..	....	..	....	..	....	..	....
62.0 - 62.9	..	....	..	....	..	....	..	....	..	....	..	....
63.0 - 63.9	..	....	..	....	..	....	..	....	..	....	..	....
64.0 - 64.9	..	....	..	....	..	....	..	....	..	....	..	....
65.0 - 65.9	..	....	..	....	..	....	..	....	..	....	..	....
66.0 - 66.9	..	....	..	....	..	....	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	..	....	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	..	....	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	1	2.4	1	1.9	1	1.9	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	1	3.1	1	2.4	1	1.9	..	....	..	....	..	....
83.0 - 83.9	1	3.1	..	....	1	1.9	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	1	3.1	1	2.4	1	1.9	1	1.9	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	..	....	..	....	..	....	..	....	1	2.0	1	2.4
89.0 - 89.9	..	....	..	....	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....	..	....	..	....
92.0 - 92.9	..	....	..	....	..	....	1	1.9	..	....	..	....
93.0 - 93.9	..	....	1	2.4	..	....	..	....	..	....	..	....
94.0 - 94.9	..	....	..	....	..	....	..	....	..	....	..	....
95.0 - 95.9	..	....	..	....	..	....	..	....	..	....	..	....
96.0 - 96.9	1	3.1	..	....	..	....	..	....	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....	..	....	..	....
98.0 - 98.9	..	....	..	....	..	....	..	....	..	....	..	....
99.0 - 99.9	..	....	..	....	..	....	..	....	..	....	..	....
100.0 - 100.9	15	46.9	23	54.7	35	64.8	39	76.5	44	88.0	40	97.6
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	1	3.2	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....	..	....
110.0 - 110.9	..	....	..	....	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	..	....	..	....	..	....	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....	..	....
115.0 - 115.9	..	....	..	....	..	....	..	....	..	....	..	....
116.0 - 116.9	..	....	..	....	..	....	..	....	..	....	..	....
117.0 - 117.9	..	....	..	....	..	....	..	....	..	....	..	....
118.0 - 118.9	..	....	..	....	..	....	..	....	..	....	..	....
119.0 - 119.9	..	....	1	2.4	..	....	..	....	..	....	..	....
120.0 - 120.9	1	3.2	1	2.4	..	....	..	....	..	....	..	....
121.0 - 121.9	..	....	..	....	..	....	..	....	..	....	..	....
122.0 - 122.9	..	....	..	....	..	....	..	....	..	....	..	....
123.0 - 123.9	..	....	..	....	..	....	..	....	..	....	..	....
124.0 - 124.9	..	....	..	....	..	....	..	....	..	....	..	....
125.0 - over	..	....	..	....	1	1.8	1	2.0	3	6.0	..	....
TOTAL	32	100.0	42	100.0	54	100.0	51	100.0	50	100.0	41	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

a combination of water-rail transportation from Eastern producers.

As stated previously, published base prices have remained stable at $2.10 for most of the period except for a slight decline in May 1939, and an increase in December 1939. Actual base prices began to decline in the second and third quarters of 1939 and in the latter period were as low as $1.65, and about 90 pct of the cases reported base prices paid lower than April 1942 published base prices, fig. 2. However, in the second quarter of 1939 several consumers were still paying the published base prices of April of that year and these were higher than published prices of April 1942. Thereafter actual base prices began to rise so that by the second quarter of 1941, 90 pct of purchases were made at the published base prices, and by the second quarter of 1942, 97 pct of the purchases were made at the published base prices.

The published extras in effect in April 1942 had not changed since November 1939. In most cases actual extras paid did not change. Cases reporting payment of extras equal to published extras of April 1942 varied from 82 pct of the total cases in the second quarter of 1939 to 99 pct in the second quarter of 1942.

In a few individual cases, however, extras increased over the period as much as 75 pct, but because extras in these cases averaged only about 10 pct of the delivered price, table II, this had relatively little effect on the delivered price. The more common extras charged on hot-rolled sheets were those for size, pickling and oiling. Concessions were often made by not charging for the pickling and oiling even though the material had been so treated.

The ratios of the price components to the delivered price of hot-rolled sheets were as follows: base price, 75 pct; extras, 20 pct, and freight, 5 pct.

Cold-Rolled Sheets. Prices actually paid for cold-rolled sheets, as shown by purchase invoices, increased in a number of cases as much as 15 pct from the second quarter of 1939 to the second quarter of 1942. Most of the advances took place before the second quarter of 1941. By that time nearly all purchasers reported paying the published prices although in a few cases, even as late as the fourth quarter of 1941, a few purchasers were paying about 5 pct less than published prices.

Published prices remained very stable throughout

TABLE XVII—Merchant Bars

Distribution of Delivered Invoice Prices of Steel Purchased by Consumers As Percentage of April 1942 Published Delivered Prices

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	1	0.7	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	1	1.1	1	0.7	1	0.6	..	....	..	....
81.0 - 81.9	1	1.1	1	0.7	1	0.6	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	1	1.1	1	0.7	..	....	..	....	..	....
89.0 - 89.9	1	1.1	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	2	2.1	2	1.4	2	1.1	1	0.5	..	....
92.0 - 92.9	2	2.1	1	0.7	1	0.6	1	0.6	..	....
93.0 - 93.9	3	3.3	..	....	2	1.1	..	....	..	....
94.0 - 94.9	1	1.1	1	0.7	..	....	..	....	..	....
95.0 - 95.9	3	3.3	8	5.6	2	1.1	5	2.7	..	....
96.0 - 96.9	3	3.3	3	2.1	4	2.2	1	0.6	..	....
97.0 - 97.9	4	4.3	4	2.8	2	1.1	2	1.1	..	....
98.0 - 98.9	7	7.6	8	5.6	4	2.2	3	1.6	..	....
99.0 - 99.9	42	45.6	74	51.7	110	61.1	113	62.3	..	....
100.0 - 100.9	5	5.4	31	21.7	46	25.5	48	26.2	170	97.7
101.0 - 101.9	3	3.3	1	0.7	..	....	2	1.1	..	....
102.0 - 102.9	1	1.1	4	2.8	2	1.1	1	0.6	..	....
103.0 - 103.9	7	7.6	1	0.7	..	....	..	....	..	....
104.0 - 104.9	2	2.2	..	....	1	0.5	3	1.6	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	1	0.6
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	1	1.1	1	0.7	..	....	..	....	..	....
109.0 - 109.9	1	1.1	..	....	..	....	..	....	..	....
110.0 - 110.9	..	....	..	....	1	0.6	1	0.6	1	0.5
111.0 - 111.9	1	1.1	..	....	..	....	..	....	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	1	0.6	1	0.5	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....
115.0 - 115.9	..	....	..	....	..	....	..	....	1	0.6
116.0 - 116.9	..	....	..	....	..	....	..	....	1	0.6
117.0 - 117.9	..	....	..	....	..	....	..	....	..	....
118.0 - 118.9	..	....	..	....	..	....	..	....	..	....
119.0 - 119.9	..	....	..	....	..	....	..	....	..	....
120.0 - 120.9	..	....	..	....	..	....	..	....	..	....
TOTAL	92	100.0	143	100.0	180	100.0	182	100.0	174	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

the entire period from April 1939, to April 1942. In May 1939, the base price at Eastern and Midwestern basing points dropped from $3.20 to $3.05 per 100 lb, where it remained through April 1942. See table XXIX. Published extras changed twice during the period in May 1939, and December 1939.[8] A few of the extras most commonly applicable—such as those for gage and width or for chemical analysis—were changed on the December 1939, list. A 6 pct increase on rail freight rates, effective Mar. 18, 1942, resulted in a slight increase in published prices.

The average percentages of invoice prices to April 1942 published prices were 95 pct in the second quarters of 1939 and 1940, 99 pct in the second and fourth quarters of 1941, and 101 pct in the second quarter of 1942.

Nearly all variation below April 1942 published prices had disappeared by the second quarter of 1942 as shown in table VIII and Fig. 4. The two cases which were still below published prices even in this period were due to actual payment of fewer extras than were applicable according to published lists.

Price increases during the period were generally the result of increased base prices. The published base price remained unchanged throughout the period at $3.05 except for April 1939 when it was $3.20, as shown in table XXIX. However, purchasers reported paying base prices of $2.65, $2.75 and $2.85 in a number of instances from the second quarter of 1939 through the second quarter of 1940.

Variations of invoice prices from April 1942 published prices in selected quarters were as follows:

Variations of Invoice Prices of Cold-Rolled Sheets From April 1942 Published Prices Selected Quarters 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939	28	75	21	4
2nd quarter 1940	47	81	19	0
2nd quarter 1941	68	12	88	0
4th quarter 1941	69	9	87	4
2nd quarter 1942	61	3	94	3

* Excluding price variations from April 1942 published prices caused by 6 pct rail rate increase, Mar. 18, 1942.

TABLE XVIII—Merchant Bars
Distribution of Actual Base Prices of Steel Purchased By Consumers As Percentages of April 1942 Published Base Prices
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
70.0 - 70.9	..	....	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	1	0.7	1	0.5	1	0.5	2	1.2
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	2	2.4	2	1.4	2	1.1	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	..	....	1	0.7	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	2	2.4	..	....	..	....	..	....	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....	..	....
92.0 - 92.9	..	....	..	....	..	....	..	....	..	....
93.0 - 93.9	4	4.8	..	....	2	1.1	..	....	..	....
94.0 - 94.9	..	....	1	0.7	..	....	1	0.6	..	....
95.0 - 95.9	3	3.6	6	4.4	1	0.6	3	1.7	..	....
96.0 - 96.9	1	1.2	..	....	1	0.6	..	....	..	....
97.0 - 97.9	4	4.7	2	1.4	..	....	1	0.6	..	....
98.0 - 98.9	7	8.3	6	4.4	1	0.6	1	0.6	..	....
99.0 - 99.9	..	....	..	....	..	....	..	....	..	....
100.0 - 100.9	51	60.7	117	84.8	167	94.4	169	95.5	170	98.8
101.0 - 101.9	1	1.2	..	....	..	....	..	....	..	....
102.0 - 102.9	1	1.2	2	1.5	1	0.6	..	....	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	8	9.5	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	1	0.5	1	0.5	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....
TOTAL	84	100.0	138	100.0	177	100.0	177	100.0	172	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

The few purchases made at rates above the April 1942 published prices in the fourth quarter of 1941 and the second quarter of 1942 were the result of increased freight costs due to changes in basing points. Three of the five cases were in the Pacific area and were the result of changes from Pacific Coast port basing points to Midwestern or Eastern basing points. This meant payment of lower base prices but much higher freight rates.

In the cases where actual extras varied from the April 1942 published extras by less than 10 pct, table X, the extras involved were for resquaring or for shearing. These two extras are expressed as percentages of the net price (base price plus all other extras). Therefore, if the base price changes, the actual cost of the extra changes even though the published extra (a percentage) remains unchanged. Therefore, in these cases an increase in actual extras as opposed to published extras did not mean a removal of concessions. In the cases where actual extras varied considerably from published extras it was because all extras applicable to the given specification had not been charged, or because lower extras than those applicable had been charged.

The ratios of the price components to the delivered price of cold-rolled sheets were as follows: base price, 90 pct; extras, 6 pct; freight, 4 pct.

Hot-Rolled Strip. Prices actually paid for hot-

TABLE XIX—Merchant Bars

Distribution of Actual Extras on Steel Purchased by Consumers As Percentages of April 1942 Published Extras

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
0.0 - 0.9	1	1.9	2	2.1	1	0.8	1	0.8	..	....
1.0 - 49.9	..	....	..	....	..	....	..	....	..	....
50.0 - 50.9	..	....	..	....	..	....	..	....	..	....
51.0 - 51.9	..	....	..	....	..	....	..	....	..	....
52.0 - 52.9	..	....	..	....	..	....	..	....	..	....
53.0 - 53.9	..	....	..	....	..	....	..	....	..	....
54.0 - 54.9	1	1.9	1	1.1	1	0.8	..	....	..	....
55.0 - 55.9	..	....	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....	..	....
57.0 - 57.9	1	1.8	1	1.1	1	0.8	..	....	..	....
58.0 - 58.9	..	....	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	..	....	..	....	..	....	..	....
60.0 - 60.9	1	1.8	..	....	..	....	..	....	..	....
61.0 - 61.9	..	....	..	....	..	....	..	....	..	....
62.0 - 62.9	..	....	..	....	..	....	..	....	..	....
63.0 - 63.9	..	....	..	....	..	....	..	....	..	....
64.0 - 64.9	..	....	..	....	..	....	..	....	..	....
65.0 - 65.9	..	....	1	1.1	1	0.8	1	0.8	..	....
66.0 - 66.9	1	1.8	1	1.0	1	0.8	1	0.8	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	1	1.1	1	0.8	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	1	1.9	2	2.1	3	2.5	2	1.7	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	..	....	1	1.1	..	....	..	....	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....	..	....
90.0 - 90.0	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....	..	....
92.0 - 92.9	..	....	..	....	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	..	....	..	....	..	....
94.0 - 94.9	..	....	..	....	..	....	..	....	..	....
95.0 - 95.9	..	....	..	....	..	....	..	....	..	....
96.0 - 96.9	..	....	..	....	..	....	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....	..	....
98.0 - 98.9	..	....	..	....	..	....	..	....	..	....
99.0 - 99.9	..	....	..	....	..	....	..	....	..	....
100.0 - 100.9	47	87.0	82	87.2	112	91.9	116	95.1	115	99.1
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....
142.0 - 142.9	..	....	..	....	..	....	..	....	..	....
143.0 - 143.9	..	....	..	....	..	....	..	....	..	....
144.0 - 144.9	..	....	..	....	..	....	..	....	..	....
145.0 - 145.9	..	....	..	....	..	....	..	....	..	....
146.0 - 146.9	..	....	..	....	..	....	..	....	..	....
147.0 - 147.9	..	....	..	....	..	....	..	....	..	....
148.0 - 148.9	..	....	..	....	..	....	..	....	..	....
149.0 - 149.9	..	....	..	....	..	....	..	....	..	....
150.0 - over	1	1.9	2	2.1	1	0.8	1	0.8	1	0.9
TOTAL	54	100.0	94	100.0	122	100.0	122	100.0	116	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

rolled strip increased in some instances by more than 20 pct between the second quarter of 1939 and the second quarter of 1942. Published prices remained nearly constant. Invoice prices closely approached the published prices by the second quarter of 1941 when over 90 pct of the purchases were made at the published prices (except for variations caused by the 6 pct increase in rail freight rates, effective Mar. 18, 1942).

The average percentages of invoice prices to April 1942 published prices were 92 pct in the second quarter of 1939, 95 pct in the second quarter of 1940, and 100 pct in the second quarters of 1941 and 1942. For the third quarter of 1939, the percentage of invoice prices to April 1942 published prices fell to 86 pct, largely because of a drop in base prices. Some prices slightly exceeded the April 1942 published price in the second quarter of 1939 because until May 1939 the published base price was $2.15 as compared with $2.10 for April 1942. Therefore, con-

TABLE XX
COLD-FINISHED BARS
Distribution of Delivered Invoice Prices of Steel Purchased by Consumers as Percentages of April 1942 Published Delivered Prices
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 First Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
50.0 - 50.9	..	....	1	1.9	1	1.7	..	....	..	....	..	....
51.0 - 51.9	..	....	..	....	..	....	..	....	..	....	..	....
52.0 - 52.9	..	....	..	....	..	....	..	....	..	....	..	....
53.0 - 53.9	..	....	..	....	..	....	..	....	..	....	..	....
54.0 - 54.9	..	....	..	....	..	....	..	....	..	....	..	....
55.0 - 55.9	..	....	..	....	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....	..	....	..	....
57.0 - 57.9	..	....	..	....	..	....	..	....	..	....	..	....
58.0 - 58.9	..	....	..	....	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	..	....	..	....	..	....	..	....	..	....
60.0 - 60.9	..	....	..	....	..	....	..	....	..	....	..	....
61.0 - 61.9	..	....	..	....	..	....	..	....	..	....	..	....
62.0 - 62.9	..	....	..	....	..	....	..	....	..	....	..	....
63.0 - 63.9	..	....	..	....	..	....	..	....	..	....	..	....
64.0 - 64.9	..	....	..	....	..	....	..	....	..	....	..	....
65.0 - 65.9	..	....	..	....	..	....	..	....	..	....	..	....
66.0 - 66.9	..	....	..	....	..	....	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	..	....	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	..	....	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	1	1.9	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	1	2.9	..	....	..	....	..	....	..	....	..	....
89.0 - 89.9	..	....	2	3.9	2	3.5	1	1.9	..	....	..	....
90.0 - 90.9	..	....	1	1.9	..	....	..	....	..	....	..	....
91.0 - 91.9	2	5.7	1	1.9	..	....	1	1.9	..	....	..	....
92.0 - 92.9	..	....	..	....	1	1.7	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	..	....	..	....	..	....	..	....
94.0 - 94.9	2	5.7	..	....	1	1.7	..	....	..	....	..	....
95.0 - 95.9	..	....	..	....	1	1.7	..	....	..	....	..	....
96.0 - 96.9	1	2.9	2	3.9	1	1.7	1	1.8	2	4.0	..	....
97.0 - 97.9	..	....	6	11.5	6	10.4	5	9.3	..	....	..	....
98.0 - 98.9	3	8.5	4	7.7	2	3.4	2	3.7	3	6.0	1	2.1
99.0 - 99.9	11	31.4	21	40.4	28	48.3	28	51.8	27	54.0	..	....
100.0 - 100.9	9	25.8	9	17.3	12	20.7	14	25.9	17	34.0	46	95.8
101.0 - 101.9	3	8.5	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	2	5.7	3	5.8	2	3.5	2	3.7	1	2.0	1	2.1
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	1	1.9	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	1	2.9	..	....	1	1.7	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....	..	....
110.0 - 110.9	..	....	..	....	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	..	....	..	....	..	....	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....	..	....
TOTAL	35	100.0	52	100.0	58	100.0	54	100.0	50	100.0	48	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

sumers paying the full published price paid more in the second quarter of 1939 than in the second quarter of 1942.

Fig. 7 and table XI present purchases of hot-rolled strip made by steel consumers distributed by invoice prices as percentages of April 1942 published delivered prices. In the second quarter of 1939 invoice prices ranged from 78 to 102 pct of April 1942 published prices, with nearly two fifths of the cases falling below 90 pct. The variation diminished until in the second quarter of 1940 only 2 pct of the cases were below the April 1942 published prices. By the second quarters of 1941 and 1942, nearly all purchases were being made at the published prices.

Variations of invoice prices from April 1942 published prices in selected quarters were:

Variations of Invoice Prices of Hot-Rolled Strip From April 1942 Published Prices Selected Quarter 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939	31	71	16	13
2nd quarter 1940	49	71	27	2
2nd quarter 1941	62	5	90	5
2nd quarter 1942	59	2	98	0

* Excluding the variations from April 1942 published prices caused by the 6 pct increase in rail freight rates effective Mar. 18, 1942.

Most of the variations of actual prices paid from the published prices were due to changes in the base prices. A comparison of Fig. 8 on base prices with Fig. 9 on extras illustrates that while actual extras in all periods closely approached the published extras, actual base prices varied widely from published base prices in the second quarter of 1939 and the second quarter of 1940. By the second quarter of 1941, however, over 91 pct of the purchases were made at the published base prices.

The ratios of the price components to the delivered price of hot-rolled strip were as follows: base price, 75 pct; extras, 18 pct; and freight, 7 pct.

Cold-Rolled Strip. Prices actually paid for cold-rolled strip increased in many instances from 20 to more than 30 pct between the second quarter of 1939 and the second quarter of 1942. Published prices remained nearly constant. After a drop of 15¢ in May 1939, published prices remained at $2.80 for cold rolled strip and $2.95 for commodity cold rolled strip, the only exception being a 20¢ drop in April 1940, as shown in table XXIX[19]. A 6-pct increase in freight rates became effective on Mar. 18, 1942, resulting in a slight increase in delivered prices.

The average percentages of invoice prices to April 1942 published prices were 91 pct in the second quarters of 1939 and 1940, 94 pct in the second quarter of 1941, 97 pct in the fourth quarter of 1941, 100 pct in the first quarter 1942, and 101 pct in the second quarter 1942.

Fig. 10 and table XIV present purchases of cold-rolled strip made by steel consumers distributed by delivered invoice prices as percentages of April 1942 published delivered prices. Considerable variation occurred in all periods prior to 1942. In the second

TABLE XXI
COLD-FINISHED BARS
Distribution of Actual Base Prices of Steel Purchased by Consumers As Percentages of April 1942 Published Base Prices
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 First Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	..	....	..	....	..	....	..	....	..	....	..	....
89.0 - 89.9	..	....	1	2.2	1	1.9	..	....	..	....	..	....
90.0 - 90.9	1	3.1	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	1	2.0	..	....	..	....
92.0 - 92.9	..	....	..	....	..	....	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	..	....	..	....	..	....	..	....
94.0 - 94.9	..	....	..	....	..	....	..	....	..	....	..	....
95.0 - 95.9	..	....	..	....	..	....	..	....	..	....	..	....
96.0 - 96.9	1	3.1	1	2.2	2	3.7	1	2.0	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....	..	....	..	....
98.0 - 98.9	5	15.6	2	4.3	2	3.7	2	4.1	1	2.1	..	....
99.0 - 99.9	..	....	..	....	..	....	..	....	..	....	..	....
100.0 - 100.9	18	56.3	41	89.1	49	90.7	45	91.9	47	97.9	46	100.0
101.0 - 101.9	6	18.8	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	1	3.1	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	1	2.2	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....	..	....
107.9 - 107.9	..	....	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....	..	....
TOTAL	32	100.0	46	100.0	54	100.0	49	100.0	48	100.0	46	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

TABLE XXII
COLD-FINISHED BARS
Distribution of Actual Extras on Steel Purchased by Consumers As Percentages of April 1942 Published Extras
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 First Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
30.0 - 49.9	..	....	1	2.2	1	1.9	..	....	..	....	..	....
50.0 - 50.9	1	3.2	1	2.2	1	1.9	..	....	..	....	..	....
51.0 - 51.9	..	....	..	....	..	....	..	....	..	....	..	....
52.0 - 52.9	..	....	..	....	..	....	..	....	..	....	..	....
53.0 - 53.9	..	....	..	....	..	....	..	....	..	....	..	....
54.0 - 54.9	..	....	..	....	..	....	..	....	..	....	..	....
55.0 - 55.9	..	....	..	....	..	....	..	....	..	....	..	....
56.0 - 56.9	..	....	..	....	..	....	..	....	..	....	..	....
57.0 - 57.9	..	....	..	....	..	....	..	....	..	....	..	....
58.0 - 58.9	..	....	1	2.1	..	....	..	....	..	....	..	....
59.0 - 59.9	..	....	..	....	..	....	..	....	..	....	..	....
60.0 - 60.9	..	....	..	....	..	....	..	....	..	....	..	....
61.0 - 61.9	..	....	..	....	..	....	..	....	..	....	..	....
62.0 - 62.9	..	....	..	....	..	....	..	....	..	....	..	....
63.0 - 63.9	..	....	..	....	..	....	..	....	..	....	..	....
64.0 - 64.9	1	3.2	1	2.1	1	1.9	..	....	..	....	..	....
65.0 - 65.9	..	....	1	2.1	..	....	..	....	..	....	..	....
66.0 - 66.9	..	....	..	....	..	....	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	..	....	..	....	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	..	....	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	..	....	1	2.1	1	2.1	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	1	3.1	2	4.4	1	1.9	..	....	..	....	..	....
85.0 - 85.9	..	....	..	....	..	....	..	....	..	....	..	....
86.0 - 86.9	1	3.1	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	..	....	..	....	..	....	..	....	..	....
88.0 - 88.9	..	....	1	2.2	..	....	..	....	..	....	..	....
89.0 - 89.9	..	....	..	....	1	1.9	1	2.1	..	....	..	....
90.0 - 90.9	..	....	4	8.7	2	3.7	..	....	..	....	..	....
91.0 - 91.9	..	....	1	2.2	1	1.9	1	2.0	1	2.1	..	....
92.0 - 92.9	..	....	..	....	..	....	..	....	..	....	..	....
93.0 - 93.9	..	....	..	....	1	1.8	1	2.0	..	....	..	....
94.0 - 94.9	1	3.1	1	2.2	1	1.8	..	....	..	....	..	....
95.0 - 95.9	1	3.1	..	....	..	....	..	....	..	....	..	....
96.0 - 96.9	..	....	..	....	..	....	..	....	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....	..	....	..	....
98.0 - 98.9	..	....	..	....	..	....	..	....	..	....	..	....
99.0 - 99.9	..	....	..	....	..	....	1	2.0	1	2.1	..	....
100.0 - 100.9	24	75.0	30	65.2	41	75.9	43	87.8	44	91.6	45	97.8
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	1	2.1	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....	..	....
110.0 - 110.9	1	3.1	1	2.2	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	1	1.8	1	2.0	..	....	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....	1	2.2
114.0 - 114.9	1	3.1	1	2.2	1	1.8	..	....	..	....	..	....
115.0 - 115.9	..	....	..	....	..	....	..	....	..	....	..	....
116.0 - 116.9	..	....	..	....	..	....	..	....	..	....	..	....
117.0 - 117.9	..	....	..	....	..	....	..	....	..	....	..	....
118.0 - 118.9	..	....	..	....	..	....	..	....	..	....	..	....
119.0 - 119.9	..	....	..	....	..	....	..	....	..	....	..	....
120.0 - 120.9	..	....	..	....	..	....	..	....	..	....	..	....
121.0 - 121.9	..	....	..	....	..	....	..	....	..	....	..	....
122.0 - 122.9	..	....	..	....	..	....	..	....	..	....	..	....
123.0 - 123.9	..	....	..	....	..	....	..	....	..	....	..	....
124.0 - 124.9	..	....	..	....	..	....	..	....	..	....	..	....
125.0 - 125.9	..	....	..	....	..	....	..	....	..	....	..	....
126.0 - 126.9	..	....	..	....	..	....	..	....	..	....	..	....
127.0 - 127.9	..	....	..	....	..	....	..	....	..	....	..	....
128.0 - 128.9	..	....	..	....	..	....	..	....	..	....	..	....
129.0 - 129.9	..	....	..	....	..	....	..	....	..	....	..	....
130.0 - 130.9	..	....	..	....	..	....	..	....	..	....	..	....
131.0 - 131.9	..	....	..	....	..	....	..	....	..	....	..	....
132.0 - 132.9	..	....	..	....	..	....	..	....	..	....	..	....
133.0 - 133.9	..	....	..	....	1	1.8	..	....	..	....	..	....
134.0 - 134.9	..	....	..	....	..	....	..	....	..	....	..	....
TOTAL	32	100.0	46	100.0	54	100.0	49	100.0	48	100.0	46	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

quarter of 1939, invoice prices ranged from 63 pct to 107 pct of April 1942 published prices, with one third of the cases falling below 85 pct. By the second quarter of 1942, 91 pct of the purchases were

Variations of Invoice Prices of Cold-Rolled Strip From April 1942 Published Prices
Selected Quarters 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939	39	79	3	18
2nd quarter 1940	49	67	27	6
2nd quarter 1941	63	46	51	3
4th quarter 1941	56	25	70	5
1st quarter 1942	55	11	78	11
2nd quarter 1942	45	2	91	7

* Excluding variations from April 1942 prices caused by 6 pct rail rate increase, Mar. 18, 1942.

being made at the published prices. Concessions in cold-rolled strip prices continued for a longer time than those for any of the other seven products studied.

Base prices paid did not show as much variation from April 1942 published prices as did extras. In the second quarter of 1939, 22 pct of the purchases were made at the April 1942 published base prices. This rose to 31 pct in the second quarter of 1940, 65 pct in the second and fourth quarters of 1941, 90 pct in the first quarter of 1942, and 100 pct in the second quarter of 1942. Prior to 1942, many purchases were made at more than the April 1942 published base prices. This was due to the existence of higher base prices prior to May 1939 and the fact that concessions were granted by pricing cold-rolled strip on a commodity cold-rolled price basis, requiring a higher base price but considerably lower extras.

There was great variation of actual extras about the published extras. Although the percentage of purchases made at the published extras varied from 47 in the first quarter of 1939 to 98 in the second quarter of 1942, prior to 1942 from 12 to 28 pct of the purchases were made at less than 50 pct of April 1942 published extras.

In many instances, cold-rolled strip was sold at a lower price on a commodity cold-rolled strip basis. During 1941 the mills removed concessions by reverting to the cold-rolled strip price, although in these cases the steel delivered was the same kind and quality. This resulted in a 65 pct increase in the delivered price for one consumer as follows:

	Commodity Cold-Rolled Strip	Cold-Rolled Strip
Base price	$2.95	$2.80
Freight	.26	.26
Extras	1.33	4.45
Delivered price	$4.54	$7.51

Some steel consumers who had bought cold-rolled strip at sheet prices were required to revert to the strip prices in 1941. For example, one consumer had to pay a 30 pct increase in delivered price as follows:

	Cold-Rolled Sheets	Cold-Rolled Strip
Base Price	$3.05	$2.80
Freight	.15	.15
Extras	.00	1.20
Delivered price	$3.20	$4.15

The ratios of the price components to the delivered price of cold rolled strip were as follows: base price, 60 pct; extras, 35 pct; and freight, 5 pct.

Merchant Bars. Prices actually paid for merchant bars, as shown by purchase invoices, increased in a number of cases, but price rises were not as great for bars as for some other steel products, notably sheets and plates. The greatest increase was 20 pct. However, actual prices, even in the case of bars, fluctuated considerably more than published prices.

Published base prices, shown in table XXIX, remained at $2.15 for Eastern basing points from June 1939 through April 1942 after dropping from $2.25 in April 1939. The only change in base prices from June 1939 to April 1942 was an increase in Pacific Coast base price from $2.75 to $2.80 in May 1940. New lists of extras* were published in April 1940 and January 1941 but the extras most commonly used, such as size extras, did not change on either list. A 6-pct increase on rail freight rates became effective Mar. 18, 1942, and caused a slight increase in published prices.

The average percentages of invoice prices to April 1942 published prices were 99 pct in the second quarters of 1939, 1940 and 1941, 100 pct in the fourth quarter of 1941, and 101 pct in the second quarter of 1942.

Variations of invoice prices from April 1942 published prices were:

Variations of Invoice Prices of Merchant Bars From April 1942 Published Prices
Selected Quarters 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939	92	32	51	17
2nd quarter 1940	143	22	73	5
2nd quarter 1941	180	10	87	3
4th quarter 1941	182	7	88	5
2nd quarter 1942	174	0	98	2

* Excluding the variations from April, 1942, published prices caused only by the 6 pct increase in all rail freight rates effective Mar. 18, 1942.

From the second quarter of 1939 through the second quarter of 1941 the range remained about the same—from 77 pct to 114 pct—but the proportion of purchases below April 1942 published prices decreased by about half in each succeeding period studied. By the second quarter of 1942 all dispersion below published prices had disappeared, Fig. 13 and table XVII and all purchases of bars were made at the published prices or more. In the case of plates and sheets, even in the latest period, some purchases were made below published prices.

Although the published base price on bars at Eastern basing points remained stationary at $2.15 between the third quarter of 1939 and the second quarter of 1942, from January through April 1939 the published base price was $2.25. Invoice prices indicated that several companies were still paying this higher base price in the third quarter of 1939. Other reasons for invoice prices higher than April 1942 published prices in the three early periods were the charging of higher extras than published, and in two cases, higher freight costs. One of the extras which

TABLE XXIII
PLATES—UNIVERSAL AND SHEARED
Distribution of Delivered Invoice Prices of Steel Purchased By Consumers As Percentages of April 1942 Published Delivered Prices
Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	1	0.6	1	0.5	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	1	0.6	..	....	..	....	..	....	..	....
83.0 - 83.9	2	1.2	..	....	..	....	..	....	..	....
84.0 - 84.9	1	0.6	1	0.4	..	....	..	....	..	....
85.0 - 85.9	3	1.8	1	0.5	..	....	..	....	..	....
86.0 - 86.9	4	2.4	1	0.5	..	....	..	....	..	....
87.0 - 87.9	..	....	1	0.5	..	....	..	....	..	....
88.0 - 88.9	2	1.2	1	0.5	..	....	..	....	..	....
89.0 - 89.9	1	0.6	1	0.5	..	....	..	....	..	....
90.0 - 90.9	5	3.0	..	....	1	0.4	..	....	..	....
91.0 - 91.9	3	1.8	5	2.3	2	0.9	..	....	..	....
92.0 - 92.9	4	2.4	6	2.8	..	....	..	....	..	....
93.0 - 93.9	3	1.8	5	2.3	2	0.9	..	....	..	....
94.0 - 94.9	..	....	3	1.4	2	0.9	..	....	..	....
95.0 - 95.9	12	7.2	19	8.8	12	5.0	1	0.4	..	....
96.0 - 96.9	5	3.0	5	2.3	..	....	..	....	..	....
97.0 - 97.9	4	2.4	3	1.4	..	....	..	....	..	....
98.0 - 98.9	21	12.5	24	11.2	12	5.0	13	5.6	..	....
99.0 - 99.9	67	40.1	97	45.1	114	47.9	124	53.2	..	....
100.0 - 100.9	14	8.4	30	13.9	61	25.6	50	21.5	187	85.0
101.0 - 101.9	3	1.8	1	0.4	7	2.9	5	2.1	2	0.9
102.0 - 102.9	5	3.0	8	3.7	11	4.6	9	3.9	..	....
103.0 - 103.9	3	1.8	..	....	..	....	2	0.9	7	3.2
104.0 - 104.9	1	0.6	1	0.5	2	0.9	3	1.3	..	....
105.0 - 105.9	..	....	..	....	2	0.9	2	0.9	2	0.9
106.0 - 106.9	..	....	..	....	3	1.3	..	....	1	0.4
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	1	0.6	..	....	1	0.4	1	0.4	..	....
109.0 - 109.9	..	....	..	....	1	0.4	4	1.7	..	....
110.0 - 110.9	..	....	..	....	1	0.4	5	2.1	2	0.9
111.0 - 111.9	1	0.6	..	....	..	....	1	0.4	2	0.9
112.0 - 112.9	..	....	..	....	..	....	..	....	1	0.4
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....
115.0 - 115.9	..	....	..	....	..	....	..	....	..	....
116.0 - 116.9	..	....	..	....	..	....	..	....	..	....
117.0 - 117.9	..	....	..	....	..	....	..	....	..	....
118.0 - 118.9	..	....	..	....	1	0.4	2	0.9	..	....
119.0 - 119.9	..	....	1	0.5	2	0.8	4	1.7	..	....
120.0 - 120.9	..	....	..	....	..	....	..	....	1	0.5
121.0 - 121.9	..	....	..	....	..	....	..	....	..	....
122.0 - 122.9	..	....	..	....	..	....	..	....	5	2.3
123.0 - 123.9	..	....	..	....	..	....	1	0.4	..	....
124.0 - 124.9	..	....	..	....	..	....	..	....	..	....
125.0 - 125.9	..	....	..	....	..	....	..	....	..	....
126.0 - 126.9	..	....	..	....	..	....	..	....	..	....
127.0 - 127.9	..	....	..	....	..	....	..	....	..	....
128.0 - 128.9	..	....	..	....	..	....	..	....	..	....
129.0 - 129.9	..	....	..	....	..	....	2	0.9	3	1.4
130.0 - 130.9	..	....	..	....	..	....	..	....	..	....
131.0 - 131.9	..	....	..	....	..	....	..	....	..	....
132.0 - 132.9	..	....	..	....	1	0.4	4	1.7	2	0.9
133.0 - 133.9	..	....	..	....	..	....	..	....	..	....
134.0 - 134.9	..	....	..	....	..	....	..	....	2	0.9
135.0 - 135.9	..	....	..	....	..	....	..	....	3	1.4
136.0 - 136.9	..	....	..	....	..	....	..	....	..	....
137.0 - 137.9	..	....	..	....	..	....	..	....	..	....
138.0 - 138.9	..	....	..	....	..	....	..	....	..	....
139.0 - 139.9	..	....	..	....	..	....	..	....	..	....
TOTAL	167	100.0	215	100.0	238	100.0	233	100.0	220	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

showed an increase quite frequently was that for sulfur content, which in some cases changed from 10¢ at the beginning to 25¢ by the end of the period. An increase in this extra usually coincided with a shift from the specification of the Society of Automotive Engineers to that of the American Iron & Steel Institute.

Only one instance of dislocated tonnage was noted on merchant bar purchases and this was on a purchase in the Pacific area.

The ratios of the price components to the delivered price of merchant bars were as follows: base price, 87 pct; extra, 6 pct; and freight, 7 pct.

Cold Finished Bars. Prices actually paid for cold finished bars, as shown by purchase invoices, showed a decline in a number of cases from the second quarter of 1939 to the second quarter of 1942. This decline varied from 1 to 6 pct.

In most cases the price decline was the result of a decrease in actual base prices from $2.70 to $2.65 during the second quarter of 1939 following a similar change in published base prices. See table XXIX.

With the exception of one change in base prices in May 1939, published prices remained very stable throughout the period. Published lists of extras[10] were changed twice during the period, in May 1939 and in September 1939. The September 1939 list was in effect in 1943. The most commonly used extras—those for size and chemical analysis—did not change on the list published in September 1939. A 6-pct increase in rail freight rates became effective on Mar. 18, 1942, and resulted in a slight increase in delivered prices.

In the instances that prices showed an advance during the period, the increase was usually the result of the removal of concessions in extras.

The average percentages of invoice prices to April 1942 published prices were 99 pct in the second quarter of 1939, 98 pct in the second quarters of 1940 and 1941, and 99 pct in the fourth quarter of 1941

TABLE XXIV

PLATES—UNIVERSAL AND SHEARED

Distribution of Actual Base Prices of Steel Purchased by Consumers as Percentages of April 1942 Published Base Prices

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
65.0 - 65.9	..	....	..	....	..	....	..	....	..	....
66.0 - 66.9	..	....	..	....	..	....	..	....	..	....
67.0 - 67.9	..	....	..	....	..	....	..	....	..	....
68.0 - 68.9	..	....	..	....	..	....	..	....	..	....
69.0 - 69.9	1	0.6	..	....	..	....	..	....	..	....
70.0 - 70.9	..	....	..	....	..	....	..	....	..	....
71.0 - 71.9	..	....	..	....	..	....	..	....	..	....
72.0 - 72.9	..	....	..	....	..	....	..	....	..	....
73.0 - 73.9	..	....	..	....	..	....	..	....	..	....
74.0 - 74.9	..	....	..	....	..	....	..	....	..	....
75.0 - 75.9	..	....	1	0.5	..	....	..	....	..	....
76.0 - 76.9	1	0.6	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	1	0.5	4	1.7	13	5.6	16	7.3
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	1	0.6	1	0.5	..	....	..	....	..	....
82.0 - 82.9	1	0.6	..	....	..	....	..	....	..	....
83.0 - 83.9	3	1.8	..	....	..	....	..	....	..	....
84.0 - 84.9	1	0.6	..	....	..	....	..	....	..	....
85.0 - 85.9	3	1.8	..	....	..	....	..	....	..	....
86.0 - 86.9	3	1.8	1	0.5	..	....	..	....	..	....
87.0 - 87.9	1	0.6	..	....	..	....	..	....	..	....
88.0 - 88.9	1	0.6	..	....	1	0.4	..	....	..	....
89.0 - 89.9	..	....	2	0.9	..	....	..	....	..	....
90.0 - 90.9	8	4.8	4	1.9	1	0.4	..	....	..	....
91.0 - 91.9	..	....	1	0.5	..	....	..	....	..	....
92.0 - 92.9	8	4.8	9	4.2	1	0.4	..	....	..	....
93.0 - 93.9	5	3.0	11	5.1	12	5.1	10	4.3	6	2.7
94.0 - 94.9	..	....	2	0.9	..	....	..	....	..	....
95.0 - 95.9	12	7.2	18	8.4	10	4.2	1	0.4	..	....
96.0 - 96.9	..	....	..	....	..	....	..	....	..	....
97.0 - 97.9	1	0.6	3	1.4	..	....	..	....	..	....
98.0 - 98.9	13	7.9	13	6.1	..	....	..	....	..	....
99.0 - 99.9	..	....	..	....	1	0.4	1	0.4	..	....
100.0 - 100.9	100	60.3	146	68.2	195	82.7	193	83.2	190	86.8
101.0 - 101.9	2	1.2	..	....	1	0.4	..	....	..	....
102.0 - 102.9	..	....	1	0.4	1	0.4	1	0.4	2	0.9
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	1	0.6	..	....	1	0.5	1	0.5	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	5	2.1	2	0.9	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	1	0.4	..	....	..	....
110.0 - 110.9	..	....	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	2	0.9	10	4.3	5	2.3
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....
TOTAL	166	100.0	214	100.0	236	100.0	232	100.0	219	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

and the first quarter of 1942. In the second quarter of 1942 the average percentage was 100 pct. By eliminating the effect of the 6-pct increase in freight rates, the ratio would approach very closely to the April 1942 price in every period.

Variations of invoice prices from April 1942 published prices in the selected periods were:

Variations of Invoice Prices of Cold Finished Bars From April 1942 Published Prices
Selected Quarters 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939	35	26	57	17
2nd quarter 1940	52	34	58	8
2nd quarter 1941	58	26	69	5
4th quarter 1941	54	18	78	4
1st quarter 1942	50	10	88	2
2nd quarter 1942	48	2	96	2

* Excluding variations from April, 1942, published prices caused only by the 6 pct increase in rail freight rates, effective Mar. 18, 1942.

Practically all variation from published prices had disappeared by the second quarter of 1942. In fact the range of variation from April 1942 published prices was relatively small even in the early periods studied, with the exception of one case which occurred in the second quarters of 1940 and 1941. In this one case the actual delivered price was only 50 pct of the April 1942 published price due to the fact that some important extras applicable to the specification had not been charged.

The ratios of the price components to the delivered price of cold finished bars were as follows: base price, 70 pct; extras, 25 pct; and freight, 5 pct.

Universal and Sheared Plates. Prices actually paid for plates, as shown by purchase invoices, increased in a number of cases by 20 to 30 pct and in one case by as much as 50 pct from the second quarter of 1939 to the second quarter of 1942. Published prices remained nearly constant throughout the period. The only change in published base prices (shown in table XXIX) during the period was a 5¢ per 100 lb increase from $2.60 to $2.65 in May 1940 for Pacific Coast port basing points. For Eastern and Midwestern basing points the base price remained at $2.10 throughout the period. Published lists of extras[11] were changed once during the period, in September 1940, but few of the extras were af-

TABLE XV—Cold-Rolled Strip
Distribution of Actual Base Prices of Steel Purchased by Consumers as Percentages of April, 1942, Published Base Prices
Selected Quarters 1939-42 (Cont. from Page 136)

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 First Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
75.0 - 75.9	..	....	1	2.4	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	..	....	..	....	..	....	..	....	..	....
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	..	....	..	....	1	1.9	..	....	..	....	..	....
83.0 - 83.9	..	....	..	....	..	....	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	..	....	1	2.4	..	....	..	....	..	....	..	....
86.0 - 86.9	1	3.1	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	..	....	1	2.4	1	1.9	1	2.0	1	2.0	..	....
88.0 - 88.9	..	....	..	....	..	....	..	....	..	....	..	....
89.0 - 89.9	1	3.1	..	....	..	....	..	....	..	....	..	....
90.0 - 90.9	..	....	..	....	..	....	..	....	..	....	..	....
91.0 - 91.9	3	9.4	1	2.4	..	....	..	....	..	....	..	....
92.0 - 92.9	2	6.2	6	14.3	2	3.7	1	2.0	1	2.0	..	....
93.0 - 93.9	..	....	4	9.5	..	....	..	....	..	....	..	....
94.0 - 94.9	2	6.2	..	....	2	3.7	..	....	1	2.0	..	....
95.0 - 95.9	..	....	..	....	..	....	..	....	..	....	..	....
96.0 - 96.9	3	9.4	5	11.9	..	....	..	....	..	....	..	....
97.0 - 97.9	..	....	..	....	..	....	..	....	..	....	..	....
98.0 - 98.9	2	6.3	2	4.7	1	1.8	1	2.0	2	4.0	..	....
99.0 - 99.9	..	....	..	....	..	....	..	....	..	....	..	....
100.0 - 100.9	7	21.9	13	30.9	35	64.8	33	64.7	45	90.0	41	100.0
101.0 - 101.9	2	6.3	5	11.9	2	3.7	1	2.0	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	2	6.3	1	2.4	2	3.7	2	3.8	..	....	..	....
104.0 - 104.9	..	....	..	....	..	....	..	....	..	....	..	....
105.0 - 105.9	4	12.5	1	2.4	4	7.4	3	5.8	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	..	....	..	....	..	....	..	....
108.0 - 108.9	1	3.1	1	2.4	4	7.4	1	2.0	..	....	..	....
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....	..	....
110.0 - 110.9	1	3.1	..	....	..	....	8	15.7	..	....	..	....
111.0 - 111.9	..	....	..	....	..	....	..	....	..	....	..	....
112.0 - 112.9	1	3.1	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....	..	....
TOTAL	32	100.0	42	100.0	54	100.0	51	100.0	50	100.0	41	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

fected. The 6-pct increase on rail freight rates of Mar. 18, 1942, resulted in a slight increase in published prices.

The average percentages of invoice prices to April 1942 published prices were 97 pct in the second quarter of 1939, 98 pct in the second quarter of 1940, 100 pct in the second quarter of 1941, 102 pct in the fourth quarter of 1941 and 103 pct in the second quarter of 1942.

Variations of Invoice Prices of Universal and Sheared Plates from April 1942 Published Prices Selected Quarters 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939.....	127	43	49	8
2nd quarter 1940.....	215	36	59	5
2nd quarter 1941.....	238	13	74	13
4th quarter 1941.....	233	6	75	19
2nd quarter 1942.....	220	0	85	15

* Excluding the variations from April, 1942, published price caused only by the 6 pct increase in rail freight rates, effective Mar. 18, 1942.

Practically all variations of invoice prices below published prices had disappeared by the second quarter of 1941 when price ceilings went into effect. This was largely caused by the early shortage of plates as compared with other steel products. By the second quarter of 1942 no purchases were reported below published prices and 15 pct of cases reported over published prices.

The range of invoice prices as percentages of April 1942 published prices was greater in the second quarter of 1942 (100 pct to 136 pct) than in the second quarter of 1939 (80 pct to 112 pct). Fig. 19 and table XXIII show that in the later period the prices varying from published prices were largely above 100 pct whereas in the earlier period most of the cases were below 100 pct. In the early period, 43 pct of purchases were made below the April 1942 published prices, while 8 pct were above. By the second quarter of 1942, no purchases were made below published prices, and 15 pct were made above. Most of the purchases made in the second quarter of 1939 at more than April 1942 published prices were caused by higher freight costs to firms in the St. Louis area which at that time were paying freight from Chicago as a basing point. In July 1941 Granite City was established as a basing point, and consequently freight costs to consumers in this area were greatly reduced.

Probably more instances of purchases above published prices occurred on plates than on any other steel product due to the greatly increased demand for plates which appeared soon after the war production program began. It was not until late 1941 and well into 1942 that production increased sufficiently to ease the shortage of plates. More exceptions to price ceilings have been granted by OPA on plates than on any other steel product.

Prices over 100 pct do not indicate violations of ceilings but are due to higher freight costs caused by changes from the basing point resulting in the lowest delivered price to the consumer to the basing point at or nearest the steel mill, and by higher base prices charged by certain marginal producers with the permission of OPA. In two cases during the second quarter of 1942, extras over 100 pct were charged. In both of these cases the extra involved was that for circular plates which is expressed as a percentage applicable to the net price (base plus all other applicable extras) of the rectangular plate from which the circular plate is cut. Therefore, if the base price charged was greater than April 1942 published base, the extra charged would also be higher than the published extra. In these cases the base price charged was $2.35 (allowed by OPA to certain producers) compared with the published base of $2.10.

The ratios of the price components to the delivered price of plates were as follows: base price, 86 pct; extras, 3 pct; and freight, 11 pct.

Structural Shapes. Average delivered prices of structural shapes were stable from the second quarter of 1939 to the corresponding quarter in 1942. The average percentages of invoice prices to April 1942 published prices were: 2nd quarter 1939, 97 pct, 2nd quarter 1940, 98 pct, 2nd quarter 1941, 99 pct, 4th quarter 1941, 100 pct, and 2nd quarter 1942, 101 pct.

Fig. XXII and table XXVI show that the range in prices in 1939 was 82 to 105 pct of the April 1942 published prices. There was little difference in the range in 1940 except that in the case of one price the ratio was 116 pct. In the second quarter of 1942, 311 purchases were made at the published prices and 11 were made above these prices. Most of the latter (the highest eight) were prices of Pacific Coast purchases and were caused by dislocated tonnage. The other five prices above 100 pct in that period were for purchases on the East Coast and were in most instances due to relief adjustments granted by OPA to certain marginal mills.

There were few concessions in extras and those in freight were minor. There were a number of reductions granted in base price. From the average percentages of invoice prices to April 1942 published prices, it is apparent that the granting of large concessions was minor.

Variations of invoice prices from April 1942 published prices in the selected quarters were:

Variations of Invoice Prices of Structural Shapes From April 1942 Published Prices Selected Quarters 1939-42

Period	No. of Purchases	Pct of Purchases Made*		
		Below April 1942 Published Price	At April 1942 Published Price	Above April 1942 Published Price
2nd quarter 1939.....	241	48	50	2
2nd quarter 1940.....	294	41	57	2
2nd quarter 1941.....	321	25	73	2
4th quarter 1941.....	333	17	81	2
2nd quarter 1942.....	322	0	97	3

* Excluding the variations from April, 1942, published prices caused only by the 6 pct increase in rail freight rates, effective Mar. 18, 1942.

Of the 116 purchases made in the first quarter of 1939 below the April 1942 published prices, 22 purchases were at prices less than 90 pct of the 1942 published prices, and none exceeded 103 pct. By the second quarter of 1942 practically all variation from published prices had disappeared.

The increase of 6 pct in freight rates granted the railroads on Mar. 18, 1942, had little relative effect on prices of structural shapes.

The ratios of the price components to the delivered price of structural shapes were as follows: base price, 89 pct; extras, less than 2 pct; and freight, 10 pct.

The Price Study. The data analyzed in this report were collected from a sample of steel consumers representing every major steel consuming industry in every major industrial area in the country. Firms surveyed used semifinished or finished steel mill products as raw materials for further fabrication or utilized them, finally, in the form received. These firms included nonintegrated steel mills which purchase semifinished steel products such as ingots and billets and turn them into finished steel products such as bars and shapes. The sample did not cover any warehouses or any firms that were subsidiaries of steel mills.

Between February and August 1942, 1063 steel consumers were interviewed and 629 of these furnished price data meeting the requirements of the survey. Over 2200 price series were obtained on semifinished and finished steel products purchased from steel mills. Products chosen were those purchased more or less regularly (monthly, if possible) between 1939 and 1942 in carlot quantities. Price series were taken on alloys whether purchased in carlots or not. The consumer's specifications of each

TABLE XXVI—Structural Shapes

Distribution of Delivered Invoice Prices of Steel Purchased by Consumers as Percentages of April 1942 Published Delivered Prices

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	..	....	..	....	..	....	..	....
82.0 - 82.9	1	0.5	1	0.3	..	....	..	....	..	....
83.0 - 83.9	1	0.5	2	0.7	..	....	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	2	0.8	1	0.3	..	....	..	....	..	....
86.0 - 86.9	6	2.5	1	0.3	..	....	..	....	..	....
87.0 - 87.9	8	3.3	3	1.0	1	0.3	..	....	..	....
88.0 - 88.9	1	0.4	..	....	..	....	..	....	..	....
89.0 - 89.9	3	1.2	..	....	..	....	..	....	..	....
90.0 - 90.9	7	2.9	13	4.4	..	....	..	....	..	....
91.0 - 91.9	17	7.0	7	2.4	1	0.3	..	....	..	....
92.0 - 92.9	9	3.7	6	2.1	5	1.6	1	0.3	..	....
93.0 - 93.9	5	2.1	18	6.2	13	4.0	6	1.8	..	....
94.0 - 94.9	2	0.8	2	0.7	1	0.3	..	....	..	....
95.0 - 95.9	19	7.9	30	10.2	26	8.1	17	5.1	..	....
96.0 - 96.9	2	0.8	2	0.7	2	0.7	1	0.3	..	....
97.0 - 97.9	4	1.7	7	2.4	7	7.5	1	0.3	..	....
98.0 - 98.9	29	12.0	28	9.5	24	2.2	30	9.0	..	....
99.0 - 99.9	106	44.0	145	49.3	183	57.0	216	14.9	..	....
100.0 - 100.9	14	5.8	24	8.2	50	15.6	53	15.9	311	96.6
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	1	0.3	..	....
103.0 - 103.9	4	1.7	2	0.7	2	0.6	1	0.3	..	....
104.0 - 104.9	1	0.4	..	....	1	0.3	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	1	0.3	..	....	..	....	..	....
107.0 - 107.9	..	....	..	....	1	0.3	2	0.6	..	....
108.0 - 108.9	..	....	..	....	2	0.6	1	0.3	3	0.9
109.0 - 109.9	..	....	..	....	..	....	..	....	..	....
110.0 - 110.9	..	....	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	..	....	..	....	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....
115.0 - 115.9	..	....	1	0.3	1	0.3	..	....	..	....
116.0 - 116.9	..	....	..	....	..	....	..	....	..	....
117.0 - 117.9	..	....	..	....	..	....	..	....	4	1.3
118.0 - 118.9	..	....	..	....	..	....	..	....	..	....
119.0 - 119.9	..	....	..	....	..	....	..	....	..	....
120.0 - 120.9	..	....	..	....	..	....	..	....	..	....
121.0 - 121.9	..	....	..	....	1	0.3	..	....	..	....
122.0 - 122.9	..	....	..	....	..	....	..	....	..	....
123.0 - 123.9	..	....	..	....	..	....	..	....	..	....
124.0 - 124.9	..	....	..	....	..	....	..	....	1	0.3
125.0 - 125.9	..	....	..	....	..	....	..	....	..	....
126.0 - 126.9	..	....	..	....	..	....	2	0.6	..	....
127.0 - 127.9	..	....	..	....	..	....	1	0.3	..	....
128.0 - 128.9	..	....	..	....	..	....	..	....	..	....
129.0 - 129.9	..	....	..	....	..	....	..	....	2	0.6
130.0 - 130.9	..	....	..	....	..	....	..	....	1	0.3
131.0 - 131.9	..	....	..	....	..	....	..	....	..	....
132.0 - 132.9	..	....	..	....	..	....	..	....	..	....
133.0 - 133.9	..	....	..	....	..	....	..	....	..	....
134.0 - 134.9	..	....	..	....	..	....	..	....	..	....
TOTAL	241	100.0	294	100.0	321	100.0	333	100.0	322	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

product chosen had to remain unchanged throughout the period.

In most instances the information was obtained from the purchasing agent. Each interview was conducted in two parts. First, certain general information regarding each firm's steel purchases was obtained by asking the following questions:

(1) What are the principal products which your company manufactures requiring the use of steel.

(2) What are the principal types of steel which you purchase?

(3) What are your major sources of steel?

(4) From what shipping points do you receive the major portion of each steel product?

(5) What are the basing points on which the purchase prices are determined for the various steel products that you use?

(6) During the past year has there been any change in the basing points on which your purchases are figured? If so, give the details, including the proportion of your purchases to which the change applies.

(7) Have any extras been charged recently which were formerly not charged?

(8) Has there been any recent change in the specifications of any of the principal steel products which you are purchasing? If so, what effects have these changes had on the prices of the products?

(9) What was the total tonnage and value of the steel you purchased in 1940?

(10) May we obtain a breakdown of the above tonnage and value by principal types of steel purchased?

(11) What was the total value of your sales in 1940?

Second, after determining just what products met the requirements of the survey, price series were obtained. Delivered prices were taken directly from purchase invoices. Because these invoices showed only the delivered unit price and sometimes freight from basing point, it was necessary to have the purchasing agent break the delivered price into its components of base price, extras and freight from basing point.

In order to compare actual prices paid with published prices, the published price buildup for April 1942 was calculated after the schedules were returned from the field. The published prices were obtained by using base prices as published in THE IRON AGE, freight rates in effect in April 1942, and extras applying to the given specification as shown in the lists of extras and deductions published by the Carnegie-Illinois Steel Corp., the Bethlehem Steel Co., and the Republic Steel Co.

Individual specifications of steel products are almost infinite in number because of the wide variety of steel products made and the limitless number of variations resulting from differences in size, chem-

TABLE XXVII—Structural Shapes

Distribution of Actual Base Prices of Steel Purchased by Consumers As Percentages of April, 1942, Published Base Prices

Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
75.0 - 75.9	..	....	..	....	..	....	..	....	..	....
76.0 - 76.9	..	....	1	0.4	2	0.6	3	0.9	8	2.5
77.0 - 77.9	..	....	..	....	..	....	..	....	..	....
78.0 - 78.9	..	....	..	....	..	....	..	....	..	....
79.0 - 79.9	..	....	..	....	..	....	..	....	..	....
80.0 - 80.9	..	....	..	....	..	....	..	....	..	....
81.0 - 81.9	..	....	2	0.7	..	....	..	....	..	....
82.0 - 82.9	1	0.4	..	....	..	....	..	....	..	....
83.0 - 83.9	1	0.4	..	....	1	0.3	..	....	..	....
84.0 - 84.9	..	....	..	....	..	....	..	....	..	....
85.0 - 85.9	11	4.8	7	2.4	1	0.3	2	0.6	..	....
86.0 - 86.9	..	....	..	....	..	....	..	....	..	....
87.0 - 87.9	2	0.9	..	....	..	....	..	....	..	....
88.0 - 88.9	2	0.9	1	0.4	..	....	..	....	..	....
89.0 - 89.9	..	....	..	....	..	....	..	....	..	....
90.0 - 90.9	26	11.2	20	6.9	..	....	..	....	..	....
91.0 - 91.9	..	....	..	....	..	....	..	....	..	....
92.0 - 92.9	10	4.3	18	6.2	14	4.5	6	1.9	..	....
93.0 - 93.9	..	....	1	0.4	2	0.6	..	....	..	....
94.0 - 94.9	1	0.4	3	1.0	..	....	..	....	..	....
95.0 - 95.9	22	9.5	27	9.4	28	8.9	16	4.9	..	....
96.0 - 96.9	..	....	..	....	1	0.3	1	0.3	..	....
97.0 - 97.9	2	0.9	5	1.7	6	1.9	..	....	..	....
98.0 - 98.9	20	8.6	17	5.9	..	....	..	....	..	....
99.0 - 99.9	4	1.7	2	0.7	3	0.9	2	0.6	..	....
100.0 - 100.9	129	55.6	183	63.5	254	80.2	294	89.9	307	96.6
101.0 - 101.9	..	....	..	....	..	....	..	....	..	....
102.0 - 102.9	..	....	..	....	..	....	..	....	..	....
103.0 - 103.9	..	....	..	....	..	....	..	....	..	....
104.0 - 104.9	1	0.4	..	....	1	0.6	..	....	..	....
105.0 - 105.9	..	....	..	....	..	....	..	....	..	....
106.0 - 106.9	..	....	..	....	..	....	..	....	..	....
107.0 - 107.9	..	....	1	0.4	..	....	..	....	..	....
108.0 - 108.9	..	....	..	....	..	....	..	....	..	....
109.0 - 109.9	..	....	..	....	3	0.9	2	0.6	3	0.9
110.0 - 110.9	..	....	..	....	..	....	..	....	..	....
111.0 - 111.9	..	....	..	....	..	....	1	0.3	..	....
112.0 - 112.9	..	....	..	....	..	....	..	....	..	....
113.0 - 113.9	..	....	..	....	..	....	..	....	..	....
114.0 - 114.9	..	....	..	....	..	....	..	....	..	....
TOTAL	232	100.0	288	100.0	316	100.0	327	100.0	318	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

ical analysis and physical treatment. In order to reduce the 2200 price series collected to comparable groups, they were first sorted according to certain major product classifications, as shown. Then for selected periods, actual prices of each specification within a product classification were computed as percentages of the April 1942 published price. These percentages were then arranged in frequency distributions to show the variation of actual prices about published prices.

The procedure was applied to the separate components of base price and extras as well as to the total delivered price.

References

[1] *Geographical and industrial distributions of these firms are shown at the end of the report.*

[2] THE IRON AGE, Jan. 7, 1943, p. 50.

[3] *Various producers' lists of extras on all principal steel prod-*

Classifications of Products Included in Sample

Semifinished
- Ingots
- Blooms
- Rerolling billets
- Forging billets
- Slabs
- Tube rounds
- Skelp
- Sheet Bars
- Wire rods

Bars
- Merchant bars
- Merchant (small) shapes
- Concrete reinforcing bars
- Cold finished bars
- Tool steel

Plates
- Universal and sheared plates
- Floor plates

Structural Shapes
- Beams
- Channels
- Angles
- Sheet piling
- Other shapes

Sheets
- Hot-rolled sheets
- Cold-rolled sheets
- Galvanized sheets
- Electrical sheets
- Enameling sheets

Strip
- Hot-rolled strip
- Cold-rolled strip

Tinplate

TernPlate
- Manufacturing ternes
- Long ternes

Black Plate

Rails and Accessories
- Rails
- Rail accessories

Tubular Products
- Standard pipe
- Oil country goods
- Line pipe
- Boiler tubes
- Mechanical tubing

Wire and Wire Products
- Manufacturers' wire
- Merchant wire
- Merchant wire products

Alloys
- Stainless steel
- Other alloys

TABLE XXVIII—Structural Shapes—Distribution of Actual Extras on Steel Purchased by Consumers as Percentages of April 1942 Published Extras—Selected Quarters 1939-42

Invoice Prices as a Pct of Published Prices April 1942	1939 Second Quarter		1940 Second Quarter		1941 Second Quarter		1941 Fourth Quarter		1942 Second Quarter	
	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases	Number of Purchases	Pct of Number of Purchases
0.0 - 0.9	2	2.7	3	3.3	1	1.0	..	..	..	..
1.0 - 49.9	..	..	..	..	..	..	..	..	..	..
50.0 - 50.9	..	..	..	..	..	..	..	..	..	..
51.0 - 51.9	..	..	..	..	..	..	..	..	..	..
52.0 - 52.9	..	..	..	..	..	..	..	..	..	..
53.0 - 53.9	..	..	..	..	..	..	..	..	..	..
54.0 - 54.9	..	..	..	..	..	..	..	..	..	..
55.0 - 55.9	..	..	..	..	..	..	..	..	..	..
56.0 - 56.9	..	..	..	..	..	..	..	..	..	..
57.0 - 57.9	..	..	..	..	..	..	..	..	..	..
58.0 - 58.9	..	..	..	..	..	..	..	..	..	..
59.0 - 59.9	..	..	..	..	..	..	..	..	..	..
60.0 - 60.9	..	..	..	..	..	..	..	..	..	..
61.0 - 61.9	..	..	..	..	..	..	..	..	..	..
62.0 - 62.9	..	..	..	..	..	..	..	..	..	..
63.0 - 63.9	..	..	..	..	..	..	..	..	..	..
64.0 - 64.9	..	..	..	..	..	..	..	..	..	..
65.0 - 65.9	..	..	..	..	..	..	..	..	..	..
66.0 - 66.9	..	..	..	..	1	1.0	..	..	..	..
67.0 - 67.9	..	..	..	..	..	..	..	..	..	..
68.0 - 68.9	..	..	..	..	..	..	..	..	..	..
69.0 - 69.9	..	..	..	..	..	..	..	..	..	..
70.0 - 70.9	..	..	..	..	..	..	..	..	..	..
71.0 - 71.9	..	..	..	..	..	..	..	..	..	..
72.0 - 72.9	..	..	..	..	..	..	..	..	..	..
73.0 - 73.9	1	1.3	1	1.1	1	1.0	..	..	..	..
74.0 - 74.9	..	..	..	..	..	..	..	..	..	..
75.0 - 75.9	1	1.3	1	1.1	1	1.0	1	1.0	..	..
76.0 - 76.9	..	..	..	..	..	..	..	..	..	..
77.0 - 77.9	..	..	..	..	..	..	..	..	..	..
78.0 - 78.9	..	..	..	..	..	..	..	..	..	..
79.0 - 79.9	..	..	..	..	..	..	..	..	..	..
80.0 - 80.9	..	..	..	..	..	..	..	..	..	..
81.0 - 81.9	..	..	..	..	..	..	..	..	..	..
82.0 - 82.9	..	..	..	..	..	..	..	..	..	..
83.0 - 83.9	..	..	..	..	..	..	..	..	..	..
84.0 - 84.9	..	..	..	..	..	..	..	..	..	..
85.0 - 85.9	..	..	..	..	..	..	..	..	..	..
86.0 - 86.9	..	..	..	..	..	..	..	..	..	..
87.0 - 87.9	..	..	..	..	..	..	..	..	..	..
88.0 - 88.9	..	..	..	..	..	..	..	..	..	..
89.0 - 89.9	..	..	..	..	..	..	..	..	..	..
90.0 - 90.9	..	..	..	..	..	..	..	..	..	..
91.0 - 91.9	..	..	..	..	..	..	..	..	..	..
92.0 - 92.9	..	..	..	..	..	..	..	..	..	..
93.0 - 93.9	..	..	..	..	..	..	..	..	..	..
94.0 - 94.9	..	..	..	..	..	..	..	..	..	..
95.0 - 95.9	..	..	..	..	..	..	..	..	..	..
96.0 - 96.9	..	..	..	..	..	..	..	..	..	..
97.0 - 97.9	..	..	..	..	..	..	..	..	..	..
98.0 - 98.9	..	..	..	..	..	..	..	..	..	..
99.0 - 99.9	..	..	..	..	..	..	..	..	..	..
100.0 - 100.9	70	93.4	86	94.5	97	96.0	102	99.0	101	100.0
101.0 - over	1	1.3	..	..	..	..	..	..	..	..
TOTAL	75	100.0	91	100.0	101	100.0	103	100.0	101	100.0

Source: U. S. Dept. of Labor, Bureau of Labor Statistics.

Distribution of Sample By Geographic Area

Area and State	No. of Companies
New England	50
Maine	
Massachusetts	
Connecticut	
Rhode Island	
Mid-Atlantic	139
Eastern New York	
Eastern Pennsylvania	
New Jersey	
Delaware	
Maryland	
Eastern Virginia	
District of Columbia	
Southeastern	21
West Virginia	
Kentucky	
Tennessee	
North Carolina	
Georgia	
Alabama	
Western Pennsylvania and Western New York	56
Ohio-Indiana (With exception of Toledo, Ohio, and Gary, Ind.)	115
Michigan-Northwestern Ohio (Toledo, Ohio, only)	46
North Central	92
Illinois (Chicago area only)	
Indiana (Gary, Hammond and South Bend only)	
Minnesota	
Wisconsin	
Central	33
Iowa	
Nebraska	
Kansas	
Missouri	
Illinois (With exception of Chicago)	
Southwestern	24
Oklahoma	
Texas	
Louisiana	
Mountain	7
Colorado	
Utah	
Pacific	47
California	
Oregon	
Washington	
Total No. of Companies	629

TABLE XXIX

Published Base Prices Per 100 lb. of Selected Steel Mill Products
Basing Point—Pittsburgh, $ Per 100 lb.

January 1939—April 1942

Year and Month	Hot-Rolled Sheets	Cold-Rolled Sheets	Hot-Rolled Strip	Cold-Rolled Strip	Commodity Cold-Rolled Sheets	Plates	Merchant Bars	Cold-Finished Bars	Structural Shapes
1939									
January	2.15	3.20	2.15	2.95	3.10	2.10	2.25	2.70	2.10
February	2.15	3.20	2.15	2.95	3.10	2.10	2.25	2.70	2.10
March	2.15	3.20	2.15	2.95	3.10	2.10	2.25	2.70	2.10
April	2.15	3.20	2.15	2.95	2.10	2.10	2.25	2.70	2.10
May	2.06	3.11	2.06	2.86	2.95	2.10	2.19	2.68	2.10
June	2.00	3.05	2.00	2.80	2.95	2.10	2.15	2.65	2.10
July	2.00	3.05	2.00	2.80	2.95	2.10	2.15	2.65	2.10
August	2.00	3.05	2.00	2.80	2.95	2.10	2.15	2.65	2.10
September	2.00	3.05	2.00	2.80	2.95	2.10	2.15	2.65	2.10
October	2.00	3.05	2.00	2.80	2.95	2.10	2.15	2.65	2.10
Nov.	2.02	3.05	2.02	2.80	2.95	2.10	2.15	2.65	2.10
Dec.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
1940									
Jan.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Feb.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Mar.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Apr.	2.10	2.93	1.98	2.64	2.75	2.10	2.15	2.65	2.10
May	1.98	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
June	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
July	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Aug.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Sept.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Oct.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Nov.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Dec.	2.10	3.05	2.10	2.80	2.90	2.10	2.15	2.65	2.10
1941									
Jan.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Feb.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Mar.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
April	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
May	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
June	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
July	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Aug.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Sept.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Oct.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Nov.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Dec.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
1942									
Jan.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Feb.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
Mar.	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10
April	2.10	3.05	2.10	2.80	2.95	2.10	2.15	2.65	2.10

Source: THE IRON AGE, Jan. 7, 1942.

ucts are identical and may be used interchangeably.

[4] "Price Discrimination in Steel," Monograph 41, Investigation of Concentration of Economic Power, Temporary National Economic Committee, pp. 22 and 23.

[5] The "base price is usually arrived at by the selection of a popular size or grade of some particular product. . . ." Benjamin F. Fairless, president, U. S. Steel Corp.

[6] THE IRON AGE, Jan. 7, 1943, p. 204.

[7] Carnegie-Illinois Steel Corp.'s List of Extras and Deductions. (Bethlehem's List in effect on hot-rolled sheets at the time of the survey was dated Dec. 8, 1939.)

[8] Bethlehem Steel Co.'s List of Extras and Deductions, Dec. 8, 1939.

[9] Carnegie-Illinois Steel Corp.'s List of Extras and Deductions in effect on merchant bars when the survey was made was dated Jan. 6, 1941. Bethlehem's list was dated Jan. 8, 1941.

[10] Bethlehem Steel Co.'s List of Extras and Deductions.

[11] Carnegie-Illinois Steel Corp.'s List of Extras and Deductions. (Bethlehem's list in effect on plates when the survey was made was dated Sept. 10, 1940.)

Distribution of Sample By Industrial Group

Industrial Group	No. of Companies
Automotive	40
Construction (some machinery, but principally fabricators of structural steels)	152
Railroad and railroad equipment	25
Container	38
Agricultural machinery	17
General industrial machinery	129
Oil, gas, and water	9
Office furniture and office equipment	37
Household durable goods	63
Shipbuilding	15
Miscellaneous, including:	104
Bolt and nut	
Cold-drawing	
Pipe and tube	
Rerolling mills	
Stainless steel	
Nail and tack	
Mines	
Airplane	
Total No. of Companies	629

Bowles Offers Copper Producers New Subsidies and Price Increases

Washington

• • • **Emphasizing that** no commitments will be made on specific prices until a wage settlement has been approved by the National Wage Stabilization Board, Economic Stabilization Director Chester Bowles and Price Administrator Paul Porter in a telegram sent last week to major copper producers explained the standards of the government's wage policy under which price and subsidy adjustments will be made. Referring to the pending wage disputes in the copper industry, the telegram pointed out that an application for price relief as a result of a wage adjustment approved by WSB will be considered on the basis of data submitted by the industry, demonstrating the extent to which price increases are required.

Commenting on this point, Mr. Porter denied that there has been a discussion of specific prices. The message said that adjustments for mines now receiving premium payments will be such as to provide an increase in revenue equal to the added cost of any approved wage adjustment. For other mines, it was declared, the adjustment will provide a return, after the wage increase, at least equal to the margin of profit per pound of metal which these mines earned in a representative peacetime period from 1936 to 1939. This was a reiteration of the policy announced by Mr. Bowles on Mar. 28. On that occasion it was pointed out that the increased revenue required under the government's wage-price standards would be provided by increased subsidy payments in the case of all mines, including properties with low operating costs not previously eligible for subsidy payments.

The Bowles-Porter announcement in their telegram provides that increased production costs resulting from wage adjustments will be met through price increases instead of through subsidy payments in the case of mines not previously receiving premium payments. The price increases, it was stated, will be in a sufficient amount to yield the full amount of the base period (1936-39) margin of profit. It was added that the price increase will afford relief to the industry only for costs to be incurred in the future. Any approved retroactive wage payments will be reimbursed to the industry under the Premium Price Plan.

The decision to meet increased production costs through price adjustments as well as subsidy payments, Mr. Bowles said, was prompted by three principal considerations: First, the desirability of limiting subsidy payments, as heretofore, to the high-cost mines, if this could be done without impairment of stabilization objectives; second, the need to avoid delay in bringing domestic copper prices more nearly into line with their probable postwar level and with world prices; and, finally, the conclusion after careful reexamination that a price adjustment at this time would not have undesirable consequences.

Tin Prices Changed

Washington

• • • **Beginning Apr. 29,** jobbers and distributors may add quantity differentials to the cost of pig tin purchased from the Office of Metals Reserve in computing ceiling prices for sales to exporters. The action was taken, OPA explained, because sales of pig tin by the OMR are made generally in lots of five tons or more while many exporters buy in smaller quantities, thus imposing hardship on jobbers who had to sell the smaller quantities at the same unit price they paid for larger quantities.

Under the new order, jobbers and distributors are allowed the same margins on small quantity sales of OMR tin as they charged for tin from other sources.

Pig Iron Chairman Quits

Washington

• • • **B. S. Stephenson,** who for the past two and one-half years has served as Chairman of the Pig Iron Industry Advisory Committee to the Office of Price Administration, has resigned. He is president of Tonawanda Iron Corporation, North Tonawanda, N. Y.

MACHINE TOOLS

. . . News and Market Activities

Down Trend in Tool Sales Continues

• • • **Coincident with the** announcement of a 20 pct increase in machine tool prices, effective Apr. 19, reliable sources in the industry report a continuing downward trend in orders and shipments, and while the additional leeway allowed by OPA will relieve the worst cases, there is a strong feeling that this is no time to raise prices.

While OPA's latest machine tool price move applies specifically to all machine tools from which ceilings were not completely removed, widespread application of the long sought increase may serve to put considerable business in the eager hand of the War Assets Administration, according to some observers. With deliveries in many cases extended to six and seven months, these sources in the trade indicate that the combination of extended deliveries and higher prices might be more than some of the traffic could bear.

Preliminary figures for March place estimated shipments for the machine tool industry as a whole at $27,100,000, of which 24 pct is foreign. New orders, based on reports from 196 companies (and three are out on strike and a few smaller companies not members of the National Machine Tool Builders Assn. have dropped out) stood at $27,800,000, compared with $21,700,000 for February, when 210 companies reported. Of March new orders, 25 pct were foreign. Unfilled orders came up to $175,000,000, for March, of which 29 pct are foreign, compared with $174,000,000 for February.

From these figures it can be inferred that March stiffened up considerably, and that orders came through nicely. However, about 25 pct of the industry's business is still earmarked for abroad, and the machine tool industry's capacity is such that a backlog of the current proportion could be chewed up in short order were the supply situation anywhere near normal.

In Cleveland, the machine tool buying activities of UNRRA, through the local office of the WAA, turned out to be the most interesting development of the week.

UNRRA, it was learned, requested 85 machine tools of various types, most of which were undeclared at the time. Since then, about half of the tools requested have been declared and are being held until all the requests are filled. All tools are earmarked for the Chinese.

In the East, a sudden change in machine tool orders, from fair to practically nothing doing, was reported by authoritative sources in the trade. Machine tool representatives heretofore reporting sales running ahead of last year at this time indicate a quick and sharp contraction in bookings.

See Pages **106, 107** *for additional news on machine tools.*

Eastern observers feel that the machine tool market has gone into at least a temporary tailspin, predicated on the theme that buyers are concentrating on conserving materials, and that the coal strike for the first time is having its effect on the flow of steel.

While such samplings of buyer attitude are largely transitory, reports from the Chicago area indicate that small tool sales are in the doldrums; although strikes at users plants are declining in number, the wheels of production have not yet begun to turn sufficiently rapidly to be reflected in the small tools picture.

Manufacturers are almost unanimous in reporting lack of availability of materials, which not only seriously hampers them, but casts a strong shadow on the tool sales picture.

Poor sales reports extend throughout the industry, both on standard and special types; both carbide and steel items are affected, some so severely that sales organizations are being contracted and heavy price concessions are reported being made. Strikes in the automotive and farm equipment fields, two of the largest using groups, resulted in sales scraping the bottom during the first quarter. With little improvement in April, sales officials now are looking to May or June, they hope, for an inevitable pickup.

While the OPA price change is still the topic of discussion in Cincinnati machine tool circles, local builders are working out their schedules to determine to what extent the recently authorized increase will be applied.

New business is still fair, but automotive demand is disappointing.

Price Rise Date Settled

Washington

• • • **Effective date** of the 20 pct price increase granted manufacturers of machine tools not included under the suspension order of Apr. 8 has been set as Apr. 19, OPA has announced. The increase applies to the manufacturers' "freeze" prices of Oct. 1, 1941.

In addition, manually operated machine tools, which are not portable, have been added to the regulation so that the price increase will also apply to them. This equipment includes both manually and foot operated presses and shears.

To Hold Tool Prices

Cleveland

• • • **Commenting on the** suspension of ceilings on machine tools by OPA, F. H. Chapin, president, National Acme Co. has announced that there is "no disposition on the part of this company to increase machine prices in general within the broad category of advances under which the recent price lifting allowances of OPA is intended to give machine manufacturers relief."

The OPA suspension, he says, provides for price increases without reservation on certain types of production machines above 2½" spindle capacity and allows for increases up to 20 pct on smaller machines over the price levels frozen on Oct. 2, 1941. Despite the fact that the company builds a range of 25 different sizes, it is expected that with very few exceptions former prices can be maintained, according to Mr. Chapin.

JET PROPULSION TURBINES *by* BROACHING . . .

Step 3

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NONFERROUS METALS

. . . News and Market Activities

Grant Brass Mills A New Price Increase

Waterbury

• • • **In conference with** the Brass Mill Industry Advisory Committee, the OPA is understood to have offered a brass mill products price increase to average 1.30¢ per lb, effective May 1, to supplement an increase of 1.50¢ per lb which became effective Apr. 1. The total increase, 2.80¢ per lb, is well below the mills' original objective reported to be 3.80¢ per lb.

The American Brass Co. is now the only brass mill remaining out of production and the company and the union expect to meet for further negotiation on Apr. 23. Officials advise that because of the price increase, price is no longer a factor in the company's negotiations with the union. Outstanding differences are now confined to questions of seniority, arbitration procedure and similar matters. The union claim is that the company is attempting to secure the modification of important sections of the contract so as to reduce the benefits of previous union activity. The company, on the other hand, sees its objective as an effort to prevent the activities of union organizers on company time.

With more than half the copper mine capacity of the country closed down due to strikes, the OPA has offered a solution of the problem in higher ceiling prices for copper, conditional on adjustment of the mine strikes. So far as can be learned, no figure for the price advance has yet been offered but there is some basis for the opinion that not more than 3¢ per lb will be offered by OPA.

With copper mines down, statistics on the copper stockpile as of Mar. 31 are significant. Refined copper in all forms on that date in the hands of the Office of Metals Reserve totalled 444,402 tons as compared with 503,722 at the end of February. This drop of nearly 60,000 tons in a single month is indicative of the speed with which the stockpile would be dissolved if the strike at the copper mines were not concluded rapidly.

Lead Price Action Awaits Copper Formula

New York

• • • **While the shortage** of lead is equally as significant as that of copper, it is apparent that OPA is attempting to set a pattern in the nonferrous metal industry by its action in the latter metal, and producers do not anticipate clearcut action to permit the solution of strikes at mines and smelters for the time being. At least there are no early meetings with government officials scheduled.

The industry has long been seeking a price advance which it believes would serve to screen out certain applications for lead and thus reduce the problem of industry allocation of available supplies. Moreover, since the ceiling price naturally serves to establish scrap prices, it would be possible by a higher scrap ceiling, producers believe, to bring out lead scrap in larger volume.

Some producers feel that a more desirable method of settling the strikes and increasing domestic production would be the payment of a subsidy to smelters based on a normal production period as from 1936 to 1939. This is believed would offer certain advantages over the payment of operating subsidies to mines.

•

Packing Charges for Lead

Washington

• • • **Sellers of lead** were provided on Apr. 24 with maximum charges that they may get special packing and loading services requested by buyers, OPA has announced.

Effective Apr. 29 sellers may charge buyers specified amounts to cover the costs of these special services. The permitted charges correspond with those permitted by OPA for packing or loading similar commodities.

The additional charges permitted by the action follow:

Pig lead or antimonial lead, wired or strapped .....30¢ per ton
Lead or antimonial lead in ingots or linked ingots, wired or strapped on wooden pallets.....50¢ per ton
Lead or antimonial lead in ingots or linked ingots, wired or strapped on steel pallets.....70¢ per ton

Wire and Cable Prices Reflect Silver Costs

Washington

• • • **OPA has announced** that, effective April 8, manufacturers of electrical wire and cable may compute the cost of the silver contained in their products at the market price of the silver not in excess of the statutory price of domestic silver. The statutory price is 71.111 per fine troy ounce of silver. Resellers of these products may pass along the dollar-and-cent amounts of the increases provided by their suppliers.

OPA's action followed a similar action affecting manufacturers of machines, parts and industrial equipment. Like that action, it was necessary because the cost of foreign silver, formerly available at much lower prices than domestic silver, has increased greatly since the removal of disparate ceilings, OPA said.

•

Canadian Demand For Copper Exceeds Output

Toronto

• • • **J. Y. Murdoch,** president of Noranda Mines, Ltd., announced that present demand for copper is considerably in excess of world production. This has been reflected in an increase in price. The British Ministry of Supply, he states, has contracted with the Canadian producers for their available tonnage during the first half of 1946 at a price of 13.5¢ per lb. However, in the domestic market, the ceiling price of 11.5¢ still prevails.

See Page 145H *for U. S. copper prices and subsidies.*

The copper supply situation is becoming critical, and the shortage for domestic consumption is slowing down operations of electrical equipment makers and new building construction programs. Obtaining copper wire for new building construction has become a serious problem. Local distributors state that they have no supplies of wire on hand.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, del'd (Min. 10,000 lb)	15.00
Aluminum pig	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb. contained Be	$14.75
Beryllium aluminum, 5% Be; dollars per lb. contained Be	$30.00
Cadmium, del'd	90.00
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Copper, electro, Conn. valley	12.00
Copper, electro, New York	11.75
Copper, lake	12.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$ 2.25
Iridium, dollars per troy oz.	$90-$100
Lead, St. Louis	6.35
Lead, New York	6.50
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$104 to $107
Nickel, electro	35.00
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per oz.	$35.00
Silver, New York, cents per oz.	70.75
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.65
Zirconium copper, 6 pct Zr, per lb contained Zr	6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	10.00 to 10.50
Aluminum, deoxidizing No. 2, 3, 4	8.25 to 10.50
Brass Ingot	
85-5-5-5 (No. 115)	13.25
88-10-2 (No. 215)	16.75
80-10-10 (No. 305)	16.00
No. 1 Yellow (No. 405)	10.25

Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded Shapes	Rods	Sheets
Copper	22.10	....	22.08
Copper, H.R.	....	18.60	....
Copper drawn	....	19.60	....
Low brass, 80%	....	21.43	20.81
High brass	....	....	21.48
Red brass, 85%	....	21.64	21.69
Naval brass	21.40	20.15	25.83
Brass, free cut	....	16.04	....
Commercial bronze, 90%	....	22.35	22.40
Commercial bronze, 95%	....	22.56	22.61
Manganese bronze	25.10	....	29.33
Phos. bronze, A, B, 5%	....	39.02	38.77
Muntz metal	21.15	19.90	24.08
Everdur, Herculoy, Olympic or equal	....	26.53	27.33
Nickel silver, 5%	....	30.80	28.62
Architect bronze	20.15	....	....

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Tubing: 2 in. OD by 0.065 in. wall: 2S-½H, 40¢; 52S-O, 61¢; 24S-T, 67.5¢; base, 2000 to 4999 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 22.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 29.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136 in. thickness: 2S, 3S, 22.7¢; 52S, 26.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 31.7¢; base, 30,000 lb and over.

Extruded Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 2S, 3S, 25.5¢; 17S, 31¢; 24S, 34¢; 53S, 28¢; 61S, 28.5¢; 63S, 26.5¢; 75S, 39¢; base 2000 to 5000 lb.

Wire, Rod and Bar—screw machine stock, rounds, 11S-T3, 17S-T, ¼ in., 28.5¢; ½ in., 26¢; 1 in., 24.5¢; 2 in., 23¢; hexagons, ¼ in., 34.5¢; ½ in., 28.5¢; 1 in., 2 in., 25.5¢; base 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam., rolled, 23.5¢; cold-finished, 24¢; base 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 37.5¢; B & S gage 23: 2S, 3S, 41.5¢; 56S, 44.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 29¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 36.5¢; base 30,000 lb.

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c.

NONFERROUS SCRAP METAL QUOTATIONS

†(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)

Copper, Copper Base Alloys

OPA Group 1†

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
No. 2 copper borings	8.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	3.00*

OPA Group 2†

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Contaminated gilded metal solids	8.00
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.00
Automobile radiators	7.25
Zincy bronze borings	7.00
Zincy bronze solids	8.00

OPA Group 3

Fired rifle shells	8.00
Brass pipe	7.25
Old rolled brass	6.75
Admiralty condenser tubes	7.25
Muntz metal condenser tubes	6.75
Plated brass sheet, pipe reflectors	6.25
Manganese bronze solids	5.50[1]
Manganese bronze solids	4.50[2]
Manganese bronze borings	4.00[1]

OPA Group 4

Refinery brass	4.50*

*Price varies with analysis, [1] Lead content 0.00 to 0.40 pct. [2] Lead content 0.41 to 1.00 pct.

Brass Mill Scrap†

Briquetted cartridge brass turnings	8.625
Cartridge brass turnings, loose	7.875
Loose yellow brass trimmings	7.875

Aluminum*

Plant scrap, segregated

2S solids	8.50 to 9.00
Dural alloys, solids 14, 17, 18, 24S, 25S	5.00 to 5.50
turnings, dry basis	3.50 to 4.00
Low copper alloys 51, 52, 61, 63S solids	7.00 to 8.00
turnings, dry basis	5.00 to 6.50

Plant scrap, mixed

Solids	5.25
Turnings, dry basis	4.00

Obsolete scrap

Pure cable	8.00
Old sheet and utensils	7.50
Old castings and forgings	6.00
Pistons, free of struts	5.00
Pistons, with struts	4.50
Old alloy sheet	3.00 to 4.00

Magnesium*

Segregated plant scrap

Pure solids and all other solids, exempt Borings and turnings	1.50

Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc

New zinc clippings, trimmings	6.50
Engravers, lithographers plates	6.50
Old zinc scrap	4.75
Unsweated zinc dross	5.00
Die cast slab	4.50
New die cast scrap	4.45
Radiator grilles, old and new	3.50
Old die cast scrap	3.00

Lead

Deduct 0.55c. a lb. from refined metal basing point prices or soft and hard lead including cable, for f.o.b. point of shipment price.

Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb.; 90 to 95% Ni, 23¢ per lb. contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	25½
Electrodeposited	18⅞
Rolled, oval, straight	19⅜
Curved	20⅜
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	23⅝
Zinc, cast, 99.99, 15 in. or longer	16¼
Nickel, 99 pct plus, frt. allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 100 oz. lots, per oz.	80¾

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbls, frt allowed	13.50
Silver Cyanide, 100 oz lots, per oz	0.655
Sodium cyanide, 96 pct, domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed	6.35

SCRAP

. . . News and Market Activities

Coal Strike Steps Up Scrap Demand

New York

• • • **The scrap shortage** continues, the coal strike and its attendant shrinkage in blast furnace and openhearth operations notwithstanding.

With the exception of the Pittsburgh district, no reduction in consumer demand is evident in reports received from the several scrap-collecting centers. In the Pittsburgh area, the decreased mill demand has eased the scrap situation somewhat. Foundries in many areas are desperately in need of good scrap and are willing to pay springboard prices to get it. Calls for mill grades have naturally become more pressing in the face of a reduction in coke output, particularly where operating scrap demand has been expanded to compensate for lack of hot metal.

There is usually a seasonal pick-up in scrap supply during the spring and summer months but the anticipated rise in industrial scrap volume has not been realized. A large motor car producer has embarked on an ambitious program calling for the utilization of scrap within the plant. Ship-breaking has not become a measurable factor in scrap operations.

Remote portions of the U. S. scrap reservoir cannot be tapped economically in the face of government regulations but there has been some increase in Canadian scrap activity in response to a direct appeal to the public by the Minister of Reconstruction.

With a strong inclination on the part of mills to build up their scrap inventories and foundry scrap in a critical position, the strong market is holding prices firmly at ceiling, repeating conditions which have existed for the past several months.

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PITTSBURGH—The decreased mill demand for scrap in this area because of the coal strike has eased the scrap situation tremendously. Further, foundries are in the midst of very critical shortages of both pig iron and coke, and this week may see a wholesale curtailment of foundry operations, further decreasing scrap demand. While some mills are still operating at high percentages, the heaviest scrap consumers are down to operations of 70 pct and under, with Carnegie-Illinois, the major scrap buyer in the district, down to about 26 pct.

•

CHICAGO—With all prices at ceiling and demand far exceeding supply, freight rates from the far west constitute the principal variable factor having a possible future influence on scrap flow. Reinstatement of the special west coast rate of $12.32 per gross ton has evinced some buyer interest, but limitation of the rate to shipyard, structural and plate scrap cuts off the possibility of bringing other material from that area. Determination of applicable freight rates will decide whether several thousand tons of slabs from Geneva, Utah, recently declared surplus, will move to this market. Foundry scrap, a scarce item for several months, has become particularly critical.

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PHILADELPHIA—Steel scrap seems to be in a little easier supply in this area and moderate shipments are going from here to the Pittsburgh area. One dealer reports sizable shipments of low phos to Pittsburgh. Cast continues very tight with keen competition among foundries for what little is available. Factors in the market are disappointed at the failure of turnings production to materialize.

•

DETROIT—The situation continued here this week without change. Demand continues to mount for open hearth grades, and the flow of production scrap is still not at levels commensurate with the intense demand. All other classes of scrap also continue heavily wanted.

•

BOSTON—Steel mill and foundry demand continues unabated. However, shop production is inadequate due to labor disputes and general adoption of a 40-hour week. Heavy steel is not easy to find and competition for lots coming on the market is exceptionally keen. For the 750 tons of unprepared offered by the Portsmouth navy yard, steel mills competed with brokers. The lot went to a Philadelphia brokerage firm at $11.82 a ton, or 50¢ above ceiling.

•

NEW YORK—The unabated demand for all grades of scrap, especially cast grades, continues in spite of the coal strike. Since scrap supplies are by far inadequate to fulfill the heavy requirements, the market remains extremely tight. Prices continue firm at ceiling, with no price changes reported during the past week.

•

BUFFALO—Calls for mill grades have become more pressing coincident with another reduction in coke output by one of the leading commercial producers and a rise in steel operations. Movement through local yards continues to decline, but 5000 tons from Duluth was unloaded at the dock of one of the big consumers over the weekend. Bookings for the season from that port, however, are reported less than half the 100,000 tons carried down by boat in 1945. The ICC hearing, held here Apr. 17, on the request of northeastern and midwestern railroads for cancellation of all freight rates on scrap of less than 70 pct of the new steel rate brought a flood of protests from leading consumers and dealers.

•

CINCINNATI—With the present high demand for iron and steel scrap in this area, dealers and brokers declare that there is a definite shortage of available scrap. In the face of this situation it is not anticipated that any reduction in consumers' operations due to lack of coal, is likely to affect the market, since consumers would buy all material available in an effort to rebuild the present dwindling inventories.

Foundries particularly are seeking good scrap, and are willing to pay springboard in order to get it.

•

CLEVELAND—No change is evident in the scrap market here. Demand continues to exceed supply by a wide and almost critical margin. With no production scrap in sight, mills are taking railroad specialties for the openhearths, and continuing to dip into dwindling inventories.

•

TORONTO—Scrap iron and steel collections are becoming more active throughout the country following the appeal by Minister of Reconstruction Howe for renewed efforts by the public in this direction. While dealers report minor improvement in receipts, they state that incoming scrap falls far short of meeting current requirements. Imports from the U. S. continue to lag far behind normal, and no deliveries have been reported from western Canada this year. However, shipments of scrap from outside points are in better volume.

Scrap Dealer Upheld

Washington

• • • In one of several cases before it regarding the rights of individuals to seek relief after OPA has changed its regulations, the Supreme Court on Monday unanimously held that the Utah Junk Co., Salt Lake City, has the right to $4,572 in premiums on sales of scrap steel made between Apr. 25, 1942 and Feb. 19, 1943. The sum was asked retroactively because of a $1.50 differential allowed by OPA on scrap sold by the company previous to a change in regulations. The company claimed and the Supreme Court speaking through Mr. Justice Frankfurter upheld it that the earlier regulation was invalid.

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used on quotations below, this indicates a ceiling price to which must be added brokerage fee and adjusted freight.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bdld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bil. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast	20.00*
Hvy. breakable cast.	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast	20.00*
Cast iron carwheels	20.00*

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$15.05*
No. 2 hvy. melting	15.05*
No. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovelings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast, chem. bor.	$13.06 to 14.15*

Truck delivery to foundry

Machinery cast	21.00 to 23.51*
Breakable cast	21.57 to 21.87*
Stove plate	20.00 to 23.51*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*
Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast	20.00*

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	18.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut	$18.50 to 19.00
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft. and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 mach'ery cast	20.00*
Breakable cast	16.50*

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	20.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00
Rails 3 ft. & under	21.00*
Cast iron carwheels	17.50 to 18.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shovel. turn.	17.00*
Cast iron borings	16.00*

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Charging box cast	19.00*
Store plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	14.25*
Cast iron borings	16.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shovel.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	$15.00 to 15.75
No. 1 hvy. melting	15.00 to 15.75
No. 2 hvy. melting	14.00 to 14.75
No. 2 bales	13.00 to 13.75
No. 3 bales	7.50 to 8.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast	19.00 to 21.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$14.50 to $15.25
No. 2 hvy. melting	13.50 to 14.25
No. 1 bales	13.50 to 14.25
No. 2 bales	12.50 to 13.25
No. 3 bales	8.00 to 9.00
Mach. shop turn.	6.00
No. 1 cupola cast	19.00 to 21.00

SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	$12.50
No. 1 & No. 2 hvy. melting	12.50
Elec. furn. 1 ft. und.	$14.00 to 15.00
No. 1 cupola cast	20.00*

HAMILTON, ONT.

Per gross ton delivered to consumer:

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

Comparison of Prices . .

Advances over past week in **Heavy Type**; declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel (cents per pound)	Apr. 23, 1946	Apr. 16, 1946	Mar. 19, 1946	Apr. 24, 1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.65
Hot-rolled strip				
6 in. and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.20
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes.	$5.25	$5.25	$5.25	$5.00
Tinplate, electro (0.50 lb)	4.75	4.75	4.75	4.50
Special coated mfg. ternes	4.55	4.55	4.55	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.50	2.50	2.50	2.15
Cold-finished bars	3.10	3.10	3.10	2.65
Alloy bars	2.808	2.808	2.808	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.76	4.76	4.76	4.40
Wire and Wire Products: (cents per pound)				
Bright wire	3.05	3.05	3.05	2.60
Wire nails	3.25	3.25	3.25	2.80
Rails: (dollars per net ton)				
Heavy rails	$43.39	$43.39	$43.39	$43.00
Light rails	49.18	49.18	49.18	43.00
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$39.00	$39.00	$39.00	$34.00
Sheet bars	38.00	38.00	38.00	34.00
Slabs, rerolling	39.00	39.00	39.00	34.00
Forging billets	47.00	47.00	47.00	40.00
Alloy blooms, billets, slabs	56.16	56.16	56.16	54.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.30	2.30	2.30	2.00
Skelp	2.05	2.05	2.05	1.90

Pig Iron: (per gross ton)	Apr. 23, 1946	Apr. 16, 1946	Mar. 19, 1946	Apr. 24, 1945
No. 2 foundry, Phila.	$28.34	$28.34	$28.34	$26.84
No. 2, Valley furnace	26.50	26.50	26.50	25.00
No. 2, Southern, Cin'ti	26.94	26.94	26.94	25.44
No. 2, Birmingham	22.88	22.88	22.88	21.38
No. 2 foundry, Chicago†	26.50	26.50	26.50	25.00
Basic, del'd eastern Pa.	27.84	27.84	27.84	26.34
Basic, Valley furnace	26.00	26.00	26.00	24.50
Malleable, Chicago†	26.50	26.50	26.50	25.00
Malleable, Valley	26.50	26.50	26.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.
‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	**18.75**	**18.75**	**18.75**	**18.75**
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$7.50	$7.50	$7.50	$7.00
Foundry coke, prompt	9.00	9.00	9.00	8.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake	12.00	12.00	12.00	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
April 23, 1946	2.69516¢ per lb.	$26.12 per gross ton.	$19.17 per gross ton.
One week ago	2.69516¢ per lb.	$26.12 per gross ton.	$19.17 per gross ton.
One month ago	2.69516¢ per lb.	$26.12 per gross ton.	$19.17 per gross ton.
One year ago	2.42471¢ per lb.	$24.61 per gross ton.	$19.17 per gross ton.

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1946	2.69516¢ Feb. 19	2.44104¢ Jan. 1	$26.12 Mar. 19	$25.37 Jan. 1	$19.17	$19.17
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	$19.17 Jan. 2	$18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

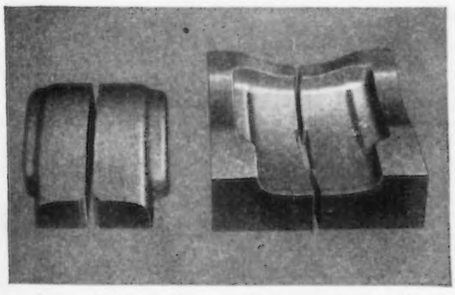
GET GOING...

Parts formed from JESSOP'S 3-C Special Cast-to-Shape Steel

FAST

WITH JESSOP CAST-TO-SHAPE DIES

As much as 60% machining time can often be eliminated by specifying JESSOP Cast-to-Shape steels for your blanking dies, drawing dies, cutting dies and other metal working applications. For these steels are cast to the shape in which they will be used after a minimum of machine finishing . . . enabling you to get into production with the least possible delay.



Automobile fender guards, punches and dies, an example of dies which are cast-to-shape from JESSOP steels.

JESSOP Cast-to-Shape dies and other tools are supplied in standard air hardening, oil hardening, water hardening, and flame hardening analyses. In addition, many other analyses, "tailor made" to customers' specifications, can be cast-to-shape. You may furnish your own patterns or have the JESSOP Pattern Shop make them from a blueprint. Write today for complete information.

JESSOP STEEL COMPANY

Established 1901

HEAD OFFICE AND WORKS: WASHINGTON, PA.

Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio	Gulf Ports, Cars	[15] Pacific Ports, Cars	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS															
Carbon, rerolling	($33.00 f. o. b. mill)														
Carbon, forging	$38	$38	$38	$38	$38	$38	$38								
Alloy	$46.80	$46.80				$46.80	(Bethlehem, Massillon, Canton, Coatesville=$46.80)								
BILLETS, BLOOMS, SLABS															
Carbon, rerolling	$39	$39	$39	$39	$39	(Provo=$50.20, Duluth=$41[14]) $39	$39	$39				$51[14]	$41		
Carbon, forging billets	$47	$47	$47	$47	$47	(Provo=$58.20, Duluth=$49[14]) $47	$47					$59[14]	$49		
Alloy	$56.16	$56.16				$56.16	(Bethlehem, Massillon, Canton=$56.16)						$61		
SHEET BARS	$38	$38		$38		$38	$38	$38	(Canton=$38)						
PIPE SKELP	2.05¢	2.05¢					2.05¢	2.05¢	(Coatesville=2.05¢)						
WIRE RODS [15]															
No. 5 to 9/32 in.	2.30¢	2.30¢		2.30¢	2.30¢	(Worcester=2.40¢)					2.55¢	2.80¢			
SHEETS															
Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.525¢	2.425¢		2.975¢	2.525¢	2.665¢	2.595¢
Cold-rolled [1]	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.925¢	3.375¢	3.615¢	3.595¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.15¢	4.05¢		4.60¢		4.29¢	4.22¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.45¢	3.90¢	4.16¢	4.12¢
Long ternes [2]	4.05¢	4.05¢	4.05¢									4.80¢		4.41¢	4.37¢
STRIP															
Hot-rolled [3] 6 in. and under	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢		2.45¢			2.45¢		3.10¢	2.55¢	2.81¢	2.77¢
Hot-rolled [3] over 6 in.	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢		2.35¢			2.35¢		3.00¢	2.45¢	2.71¢	2.67¢
Cold-rolled [4]	3.05¢	3.15¢		3.05¢			3.05¢	(Worcester=3.25¢)					3.15¢	3.41¢	3.37¢
Cooperage stock	2.55¢	2.55¢			2.55¢		2.55¢							2.91¢	
Commodity cold-rolled	3.20¢	3.30¢		3.20¢			3.20¢	(Worcester=3.60¢)					3.30¢	3.56¢	
TINPLATE,															
Standard cokes, base box	$5.25	$5.25	$5.25		$5.35			$5.35	$5.35					$5.60[11]	$5.53[11]
Electro, box 0.25 lb	$4.60	$4.60	$4.60					$4.70							
Electro, box 0.50 lb	$4.75	$4.75	$4.75					$4.85	$4.85						
Electro, box 0.75 lb	$4.90		$4.90					$5.00	$5.00						
BLACKPLATE															
29 gage [5]	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢						3.57¢
TERNES, MFG.															
Special coated, base box	$4.55	$4.55	$4.55					$4.65	$4.65						
BARS								(Duluth=2.60¢)							
Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	(Provo, Utah=3.20¢)			2.85¢	3.15¢	2.60¢	2.84¢	2.82¢
Rail steel [6]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.85¢	3.15¢			
Reinforcing (billet) [7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢			2.70¢	2.75¢	2.45¢	2.59¢	2.67¢
Reinforcing (rail) [7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢		2.57¢
Cold-finished [8]	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢	(Detroit=3.15¢)				(Toledo=3.25¢)			3.44¢	3.42¢
Alloy, hot-rolled	2.808¢	2.808¢				2.808¢	2.808¢	(Bethlehem Massillon, Canton=2.808¢)					2.908¢		
Alloy, cold-drawn	3.484¢	3.484¢	3.484¢	3.484¢		3.484¢							3.584¢		
PLATE								(Coatesville and Claymont=2.50¢, Provo, Utah=3.20¢)							
Carbon steel [13]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢			2.85¢	3.05¢	2.72¢	2.69¢	2.55¢
Floor plates	3.75¢	3.75¢									4.10¢	4.40¢		4.11¢	4.07¢
Alloy	3.64¢	3.64¢			(Coatesville=3.64¢)						4.108¢	4.316¢		3.64¢	3.73¢
SHAPES															
Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢	(Bethlehem=2.35¢)				2.60¢	3.00¢		2.52¢	2.465¢
SPRING STEEL, C-R															
0.26 to 0.50 carbon	3.05¢			3.05¢			(Worcester=3.25¢)								
0.51 to 0.75 carbon	4.65¢			4.65¢			(Worcester=4.85¢)								
0.76 to 1.00 carbon	6.65¢			6.65¢			(Worcester=6.85¢)								
1.01 to 1.25 carbon	9.03¢			9.03¢			(Worcester=9.23¢)								
WIRE [9]															
Bright [12]	3.05¢	3.05¢		3.05¢	3.05¢		(Worcester=3.15¢)		(Duluth=3.10¢)			3.55¢			3.37¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	3.65¢	3.65¢		3.65¢			(Worcester=3.75¢)					4.15¢			3.97¢
PILING															
Steel sheet	2.65¢	2.65¢				2.65¢						3.20¢			2.97¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.46	30.30	23.80	24.34	34.62	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32 46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Newark, N. J., Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 6 in.)	72.09	72.09	.....	68.49	.....	.....

SHELL STEEL

	per gross ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic openhearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.00 higher; East Michigan, $3 higher.

Price Exceptions: Follansbee Steel Corp. permitted to sell at $13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of $52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	$43.59
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	*per net ton*
Light rails (from billets)	$49.18
Light rails (from rail steel)	48.29
	base per lb
Cut spikes	3.65¢
Screw spikes	5.55¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	4.75¢
Track bolts, heat treated, to railroads	5.00¢
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25c.

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.)*
An increase of 8.2 pct applies to extras

	base per lb
High speed	72.5¢
Straight molybdenum	58.4¢
Tungsten-molybdenum	62.2¢
High-carbon-chromium*	46.5¢
Oil hardening*	26.0¢
Special carbon*	23.8¢
Extra carbon*	19.5¢
Regular carbon*	15.2¢

Warehouse prices east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	18.72*	19.76
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

*Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	Pacific Coast Basing Points†
	base per keg	
Standard wire nails	$3.25	$3.75
Coated nails	3.25	3.75
Cut nails, carloads	3.85	....
	base per 100 lb	
Annealed fence wire	$3.50	$4.00
Annealed galv. fence wire	3.85	4.35
	base column	
Woven wire fence*	72	90
Fence posts, carloads	74	91
Single loop bale ties††	72	97
Galvanized barbed wire**	79	89
Twisted barbless wire	79	89

*15½ gage and heavier. **On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50¢ a ton.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$8.50	$17.00
15-lb coating I.C.	9.50	19.00
20-lb coating I.C.	10.00	20.00

ALLOY EXTRAS

Alloy Steel	Basic Openhearth		Electric Furnace	
	Bars and Bar-strip	Billets, Blooms and Slabs	Bars and Bar-strip	Billets, Blooms and Slabs
NE 8600	0.676¢	$13.52	1.196¢	$23.92
NE 8700	0.728	14.56	1.248	24.96
NE 9400	0.780	15.60	1.300	26.00
NE 9700	0.676	13.52	1.196	23.92
NE 9800	1.352	27.04	1.872	37.44
NE 9900	1.248	24.96	1.612	32.24

The extras shown are in addition to the base price of $2.808 per 100 lb on finished products and $56.16 per gross ton on semifinished steel, major basing points, as shown in table, opposite page, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. When acid openhearth is specified and acceptable, add to **basic openhearth alloy differential 0.26¢ per lb for bars and bar-strip and $5.20** per gross ton for billets, blooms and slabs.

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills
(F.o.b. Pittsburgh only on wrought pipe) base price—$200.00 per net ton

Steel (buttweld)

	Black	Galv.
⅛-in.	60½	48
¼-in.	63½	52
1-in. to 3-in.	65½	54½

Wrought Iron (buttweld)

⅛-in.	18	+4
¼-in.	24	2½
1-in. and 1¼-in.	28½	9
1½-in.	33	12
2-in.	32	11

Steel (lapweld)

2-in.	58	46½
2½-in. and 3-in.	61	49½
3½-in. to 6-in.	63	51½

Wrought Iron (lapweld)

2-in.	25	4½
2½-in. to 3½-in.	26	7
4-in.	28	11
4½-in. to 8-in.	27	10

Steel (butt, extra strong, plain ends)

½-in.	58½	47½
¾-in.	62½	51½
1-in. to 3-in.	64	54

Wrought Iron (same as above)

½-in.	19	+1½
¾-in.	25	4½
1-in. to 2-in.	33	13

Steel (lap, extra strong, plain ends)

2-in.	56	45½
2½-in. and 3-in.	60	49½
3½-in. to 6-in.	63½	53

Wrought Iron (same as above)

2-in.	28	8½
2½-in. to 4-in.	34	16
4½-in. to 6-in.	32	14½

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or $2 a ton higher on all buttweld.

BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless Cold-Drawn	Seamless Hot-Rolled	Lapweld, Hot-Rolled
2 in. O.D. 13 B.W.G.	16.52	13.90	13.20
2½ in. O.D. 12 B.W.G.	22.21	18.70	17.67
3 in. O.D. 12 B.W.G.	24.71	20.79	19.56
3½ in. O.D. 11 B.W.G.	31.18	26.25	24.68
4 in. O.D. 10 B.W.G.	38.68	32.56	30.55

(Extras for less carload quantities)

40,000 lb or ft and over	Base
30,000 lb or ft to 39,999 lb or ft	5 pct
20,000 lb or ft to 29,999 lb or ft	10 pct
10,000 lb or ft to 19,999 lb or ft	20 pct
5,000 lb or ft to 9,999 lb or ft	30 pct
2,000 lb or ft or 4,999 lb or ft	45 pct
Under 2,000 lb or ft	65 pct

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago....$60.80
6-in. and larger, del'd New York... 60.20
6-in. and larger, Birmingham..... 52.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle 74.00

For all rail shipment; rail and water shipment less.

Class "A" and gas pipe, $3 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 7 pct applies to all listings.

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

Percent Off List

½ in. & smaller x 6 in. & shorter....65½
9/16 & ⅝ in. x 6 in. & shorter.....63½
¾ to 1 in. x 6 in. & shorter.....61
1⅛ in. and larger, all lengths.....59
All diameters over 6 in. long.....59
Lag, all sizes.....62
Plow bolts.....65

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller.....62
9/16 to 1 in. inclusive.....59
1⅛ to 1½ in. inclusive.....57
1⅝ in. and larger.....56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 in. through 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 pct additional discount.

Stove Bolts

Consumer

Packages, nuts loose.....71 and 10
In packages.....71
In bulk.....80

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)

Base per 100 Lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham.....$3.75

Small Rivets

(7/16 in. and smaller)

Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham.....65 and 5

Cap and Set Screws	*Consumer Percent Off List*
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Exception

When the WPB Steel Div. certifies in writing the consumers need for one of the higher grades of metallurgical fluorspar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, cents per lb, ton lots.

Copper, electrolytic, 150 and 200 mesh.....21½¢ to 23½¢
Copper, reduced, 150 and 200 mesh.....20½¢ to 25¼¢
Iron, commercial, 100 and 200 mesh 96 + % Fe.....12½¢ to 18¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots.....4¢
Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe, drum lots.....63¢
Iron, electrolytic, unannealed, 300 mesh and coarser, 99 + % Fe 30 to 33¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe.....43¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe.....90¢
Aluminum, 100 and 200 mesh.....*25¢
Antimony, 100 mesh.....30¢
Cadmium, 100 mesh.....$1.40
Chromium, 100 mesh and finer....$1.25
Lead, 100, 200 & 300 mesh....11½ to 15¢
Manganese.....65¢
Nickel, 150 mesh.....51½¢
Solder powder, 100 mesh..8½¢ plus metal
Tin, 100 mesh.....58¾¢
Tungsten metal powder, 98%-99%, any quantity, per lb.....$2.60
Molybdenum powder, 99%, in 200-lb kegs, f.o.b. York, Pa., per lb...$2.60
Under 100 lb.....$3.00

*Freight allowed east of Mississippi.

COKE

Furnace, beehive (f.o.b. oven)	**Net Ton**
Connellsville, Pa.	$7.50*
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.10
Connellsville, Pa.	9.00
Foundry, Byproduct	
Chicago, del'd	13.75
Chicago, f.o.b.	13.00
New England, del'd	14.65
Kearny, N. J., f.o.b.	13.05
Philadelphia, del'd	13.28
Buffalo, del'd	13.40
Portsmouth, Ohio, f.o.b.	11.50
Painesville, Ohio, f.o.b.	12.15
Erie, del'd	13.15
Cleveland, del'd	13.20
Cincinnati, del'd	13.25
St. Louis, del'd	13.75†
Birmingham, del'd	10.90

*Hand drawn ovens using trucked coal permitted to charge $8.60 per ton plus transportation charges.

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of $14.25 in the St. Louis, Mo., and East St. Louis, Ill., switching districts.

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick*	*Per 1000*
Super-Duty brick, St. Louis	$76.05
First quality, Pa., Md., Ky., Mo., Ill.	60.40
First quality, New Jersey	65.90
Sec. quality, Pa., Md., Ky., Mo., Ill.	54.80
Sec. quality, New Jersey	57.70
No. 1 Ohio	50.00
Ground fire clay, net ton	8.95

Silica Brick*	
Pennsylvania and Birmingham	$60.40
Chicago District	69.30
Silica cement, net ton (Eastern)	10.60

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$54.00

Magnesite Brick	
Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00

Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$43.48
Domestic, f.o.b. Chewelah, Wash. in bulk	32.00
in sacks	36.00

*Retroactive to Apr. 1.

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports*)

Per Gross Ton

Old range, bessemer, 51.50.....$4.95
Old range, non-bessemer, 51.50....4.80
Mesaba, bessemer, 51.50.....4.70
Mesaba, non-bessemer, 51.50.....4.55
High phosphorus, 51.50.....4.35

*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb. These are zoned warehouse prices in conformance with latest zoning amendment to OPA Price Schedule 49.

Cities	SHEETS			STRIP			Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot-Rolled (10 gage)	Cold-Rolled	Galvanized (24 gage)	Hot-Rolled 6 in. and Under	Hot-Rolled Over 6 in.	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, NE 8617-20	Hot-Rolled, NE 8742-50 Ann.	Cold-Drawn, NE 8617-20	Cold-Drawn, NE 8742-50 Ann.
**Philadelphia	$3.743	$5.097	$5.218a	$4.272	$4.172	$5.022	$3.855	$3.916	$4.072	$4.522	$6.016	$7.216	$7.372	$8.522
New York	3.815	4.838[3]	5.46	4.524	4.224	5.024	4.018	4.008	4.103	4.553	6.058	7.158	7.403	8.453
Boston	3.999	4.969[9]	5.674	4.456	4.356	4.965	4.162	4.162	4.294	4.594	6.212	7.312	7.444	8.494
Baltimore	3.619	5.077	5.344	4.252	4.152	....	3.844	4.009	4.052	4.502	....	....	....	....
Norfolk	3.998	....	5.821	4.515	4.415	....	4.221	4.252	4.315	4.615	....	....	....	....
Chicago	3.475	4.425	5.581	3.95	3.85	4.90[17]	3.80	3.80	3.75	4.20	....	....	....	....
Milwaukee	3.612	4.562[3]	5.537	4.087	4.077	5.037[17]	3.937	3.937	3.887	4.337	6.037	7.037	7.187	8.237
Cleveland	3.575	4.625	5.327	3.95	3.85	4.70[17]	3.65	3.838	3.60	4.20	6.006	....	6.95	....
Buffalo	3.575	4.625	5.104	4.169	4.069	4.919	3.88	3.65	3.60	4.20	5.80	6.90	7.95	8.00
Detroit	3.675	4.725	5.45	4.05	3.95	....	3.859	3.911	3.70	4.25	6.13	....	7.259	....
Cincinnati	3.65	4.70[3]	5.275	4.025	3.925	4.961	3.911	3.941	3.861	4.461	6.15	....	7.311	....
St. Louis	3.622	4.572[3]	5.581	4.097	3.997	5.181[17]	3.947	3.947	3.897	4.481	6.181	....	7.331	....
Pittsburgh	....	....	....	....	....	....	....	....	....	4.20	....	....	....	....
St. Paul	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Omaha	4.018	5.668	5.965	4.343	4.243	....	4.343	....	4.293	4.893	....	....	....	....
Indianapolis	3.745	4.795	5.37	4.12	4.02	4.99	3.88	3.88	3.83	4.43	6.13	....	7.28	....
Birmingham	3.675	....	5.20	....	....	....	3.80	3.80	3.75	4.903	....	....	....	....
Memphis	4.19	4.885	5.715	4.565	4.465	....	4.315	4.315	4.265	4.78	....	....	....	....
New Orleans	4.283*	5.304	5.808	4.658	4.558	....	4.408	4.408*	4.358*	5.079	....	....	....	....
Houston	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Los Angeles	5.00	7.20[3]	....	4.95	4.85	....	4.95	4.65	4.40	5.683	....	....	....	....
San Francisco	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seattle	4.87[12]	7.27[4]	6.40	4.60	4.50	....	5.00[12]	4.70[12]	4.60[12]	6.23	....	....	....	....
Portland	4.87[11]	6.82[4]	6.20	5.10	5.00	....	5.00[11]	4.70[11]	4.70[11]	5.98	8.15	....	9.20	....
Salt Lake City	....	....	....	....	....	....	....	....	....	....	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1499 lb; strip, extras on all quantities; bars, 1500 lb base.

NE ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 150 to 499 lb. (2) 150 to 1499 lb. (3) 400 to 1499 lb. (4) 450 to 1499 lb. (5) 500 to 1499 lb. (6) 0 to 199 lb. (7) 400 to 1499 lb. (8) 1000 to 1999 lb. (9) 450 to 3749 lb. (10) 400 to 3999 lb. (11) 300 to 4999 lb. (12)) 300 to 10,000 lb. (13) 400 to 14,999 lb. (14) 400 lb and over. (15) 1000 lb and over. (16) 1500 lb and over. (17) 2000 lb and over. (18) 3500 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 0.271¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Maximum per gross ton, effective Mar. 15, 1946.
Prices do not reflect 3 pct tax on freight.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	27.00	27.50	28.00	28.50	.....	Boston	Everett	0.50	27.50	28.00	28.50	29.00	.....
Birdsboro	27.00	27.50	28.00	28.50	32.00	Boston	Birdsboro-Steelton	4.02	.....	.....	.....	.....	36.02
Birmingham	21.50	22.88	.....	27.50	.....	Brooklyn	Bethlehem	2.50	29.50	30.00	30.50	31.00	.....
Buffalo	25.50	26.50	27.00	27.50	32.00	Brooklyn	Birdsboro	2.92	.....	.....	.....	.....	34.92
Chicago	26.00	26.50	26.50	27.00	.....	Canton	Clev, Ygstn, Sharpsvil	1.39	27.39	27.89	27.89	28.39	.....
Cleveland	26.00	26.50	26.50	27.00	.....	Canton	Buffalo	3.19	.....	.....	.....	.....	35.19
Detroit	26.00	26.50	26.50	27.00	.....	Cincinnati	Birmingham	4.06	25.56	26.94	.....	.....	.....
Duluth	26.50	27.00	27.00	27.50	.....	Cincinnati	Hamilton	1.11	.....	.....	27.61	.....	.....
Erie	26.00	26.50	27.00	27.50	.....	Cincinnati	Buffalo	4.40	.....	.....	.....	.....	36.40
Everett	27.00	27.50	28.00	28.50	.....	Jersey City	Bethlehem	1.53	28.53	29.03	29.53	30.03	.....
Granite City	26.00	26.50	26.50	27.00	.....	Jersey City	Birdsboro	1.94	.....	.....	.....	.....	33.94
Hamilton	26.00	26.50	26.50	.....	.....	Los Angeles	Provo	4.95	28.95	29.45	.....	.....	.....
Neville Island	26.00	26.50	26.50	27.00	.....	Los Angeles	Buffalo	15.41	.....	.....	.....	.....	47.41
Provo	24.00	24.50	.....	.....	.....	Mansfield	Cleveland-Toledo	1.94	27.94	28.44	28.44	28.94	.....
Sharpsville[1]	26.00	26.50	26.50	27.00	.....	Mansfield	Buffalo	3.36	.....	.....	.....	.....	35.36
Sparrows Point	27.00	27.50	.....	.....	.....	Philadelphia	Swedeland	0.84	27.84	28.34	28.84	29.34	.....
Steelton	27.00	.....	.....	.....	32.00	Philadelphia	Birdsboro	1.24	.....	.....	.....	.....	33.24
Swedeland	27.00	27.50	28.00	28.50	.....	San Francisco	Provo	4.95	28.95	29.45	.....	.....	.....
Toledo	26.00	26.50	26.50	27.00	.....	San Francisco	Buffalo	15.41	.....	.....	.....	.....	47.41
Youngstown	26.00	26.50	26.50	27.00	.....	Seattle	Provo	4.95	28.95	29.45	.....	.....	.....
						Seattle	Buffalo	15.41	.....	.....	.....	.....	47.41
						St. Louis	Granite City	0.50	26.50	27.00	27.00	27.50	.....
						St. Louis	Buffalo	7.07	.....	.....	.....	.....	39.07

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, $38.00 and $34.00, respectively. Newberry Brand of Lake Superior charcoal iron $39.00 per g.t., f.o.b. furnace, by order L 39 to RPS 10, Apr. 11, 1945, retroactive to Mar. 7, 1945. Delivered to Chicago, $42.34. High phosphorus iron sells at Lyles, Tenn., at $28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. Effective Mar. 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron and bessemer ferrosilicon up to and including 14.00 pct silicon covered by RPS 10 as amended. Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$32.00; f.o.b. Buffalo—$33.25. Add $1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for prices of comparable analysis.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	148.50
F.o.b. Pittsburgh	139.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	6.05¢	6.30¢	6.60¢
Ton lots	6.65¢	7.55¢	8.55¢
Less ton lots	6.80¢	7.80¢	8.80¢

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50
F.o.b. Pittsburgh, Chicago	40.00	

Manganese Metal

Contract basis, lump size, per pound of metal, f.o.b. shipping point, freight allowed.

96-98% Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30¢
L.c.l. lots	32¢

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	34¢
Ton lots	36¢
Less ton lots	38¢

Low-Carbon Ferromanganese

Contract price per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10% max. C, 0.06% P, 90% Mn	21.00¢	21.40¢	21.65¢
0.10% max. C	20.50¢	20.90¢	21.15¢
0.15% max. C	20.00¢	20.40¢	20.65¢
0.30% max. C	19.50¢	19.90¢	20.15¢
0.50% max. C	19.00¢	19.40¢	19.65¢
0.75% max. C, 7.00% max. Si	16.00¢	16.40¢	16.65¢

Silicomanganese

Contract basis, lump size, per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05¢
Ton lots	6.70¢
Briquet, contract basis, carlots, bulk, freight allowed, per lb. of briquet	5.80¢
Ton lots	6.30¢
Less ton lots	6.55¢

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $48.75 f.o.b. Keokuk, Iowa; $46.75 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%. Covered by MPR 405.

Silicon Metal

Contract price per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.

	Eastern	Central	Western
96% Si, 2% Fe	13.10¢	13.55¢	16.50¢
97% Si, 1% Fe	13.45¢	13.90¢	16.80¢

Ferrosilicon Briquets

Contract price per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination. 40% Si.

	Eastern	Central	Western
Carload, bulk	3.35¢	3.50¢	3.65¢
Ton lots	3.80¢	4.20¢	4.25¢

Electric Ferrosilicon

Contract price per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
50% Si	6.65¢	7.10¢	7.25¢
75% Si	8.05¢	8.20¢	8.75¢
80-90% Si	8.90¢	9.05¢	9.55¢
90-95% Si	11.05¢	11.20¢	11.65¢

Ferrochrome (65-72% *Cr, 2% max. Si*)

Contract prices per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00¢	23.40¢	24.00¢
0.10% C	22.50¢	22.90¢	23.50¢
0.15% C	22.00¢	22.40¢	23.00¢
0.20% C	21.50¢	21.90¢	22.50¢
0.50% C	21.00¢	21.40¢	22.00¢
1.00% C	20.50¢	20.90¢	21.50¢
2.00% C	19.50¢	19.90¢	20.50¢
66-71% Cr, 4-10% C	13.00¢	13.40¢	14.00¢
62-66% Cr, 5-7% C	13.50¢	13.90¢	14.50¢

Briquets—contract price per pound of briquet, f.o.b. shipping point, freight allowed. 60% chromium.

	Eastern	Central	Western
Carload, bulk	8.25¢	8.55¢	8.95¢
Ton lots	8.75¢	9.25¢	10.75¢
Less ton lots	9.00¢	9.50¢	11.00¢

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66-71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

S. M. Ferrochrome

Contract price per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	14.00	14.40	15.00
Ton lots	14.90	15.55	16.75
Less ton lots	15.40	16.05	17.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25 max. C.

	Eastern	Central	Western
Carload	20.00	20.40	21.00
Ton lots	21.00	21.65	22.85
Less ton lots	22.00	22.65	23.85

Chromium Metal

Contract prices per pound, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Chromium—Copper

Contract price per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.

Shot or ingot	45¢

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	13.00	13.50	15.55
Ton lots	14.50	15.25	17.40
Less ton lots	15.50	16.25	18.40

Calcium—Manganese—Silicon

Contract prices per pound of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50¢	16.00¢	18.05¢
Ton lots	16.50¢	17.35¢	19.10¢
Less ton lots	17.00¢	17.85¢	19.60¢

Calcium Metal

Eastern zone contract prices per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.35	$1.75	$4.25
Less ton lots	1.60	2.00	5.00

CMSZ

Contract price per pound of alloy, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.			
Ton lots	12.00¢	12.75¢	14.75¢
Less ton lots	12.50¢	13.25¢	15.25¢
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.			
Ton lots	11.75¢	12.50¢	14.50¢
Less ton lots	12.25¢	13.00¢	15.00¢

SMZ

Contract price per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots	12.00¢	12.85¢	14.60¢
Less ton lots	12.50¢	13.35¢	15.10¢

Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed	$1.88
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V...	
Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5	$1.10
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb.	
Ton lots	$2.25
Less ton lots	$2.30
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	95¢
Calcium molybdate, 40-45¢, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10%C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10%C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads	$142.50
Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	14¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	4.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload	5.75¢
Ton lots	7.25¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound.	
Car lots	8.00¢
Ton lots	8.75¢
Less ton lots	9.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

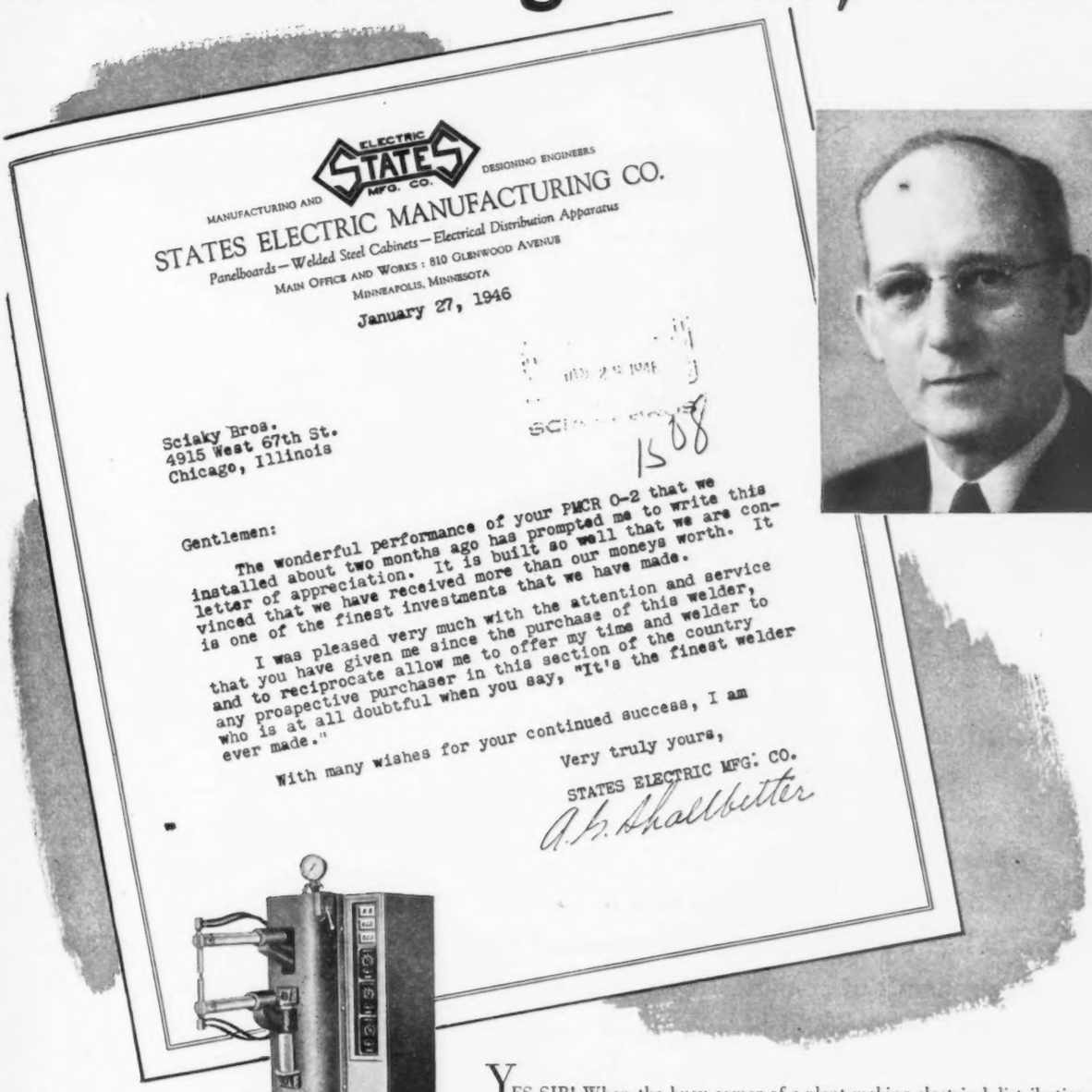
Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125	$2.1445

Silcaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	25¢
Ton lots	26¢
Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	58¢
Ton lots	59¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	87.5¢
No. 6	60¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Them's Strong Words, Mr. S.!



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MANUFACTURING AND DESIGNING ENGINEERS

STATES ELECTRIC MANUFACTURING CO.

Panelboards—Welded Steel Cabinets—Electrical Distribution Apparatus

MAIN OFFICE AND WORKS: 810 GLENWOOD AVENUE

MINNEAPOLIS, MINNESOTA

January 27, 1946

Sciaky Bros.
4915 West 67th St.
Chicago, Illinois

Gentlemen:

The wonderful performance of your PMCR O-2 that we installed about two months ago has prompted me to write this letter of appreciation. It is built so well that we are convinced that we have received more than our moneys worth. It is one of the finest investments that we have made.

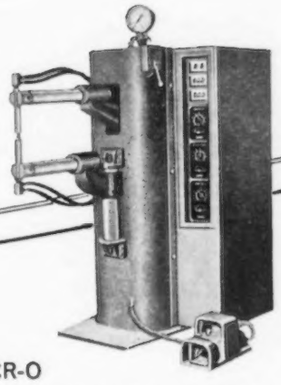
I was pleased very much with the attention and service that you have given me since the purchase of this welder, and to reciprocate allow me to offer my time and welder to any prospective purchaser in this section of the country who is at all doubtful when you say, "It's the finest welder ever made."

With many wishes for your continued success, I am

Very truly yours,

STATES ELECTRIC MFG. CO.

A. F. Shallbetter



SERIES PMCR-O

The machine praised by Mr. Shallbetter is one of a Series of small completely automatic welders. Several features make it unique for a machine of its size. Heavy duty roller bearings at the fulcrum point of the rocker arm assure long life. Retraction stroke is provided. Machine is a complete self-contained unit with electronic controls mounted in hinged cabinet convenient to operator. Standard frame and control unit may be furnished with any of 5 transformer sizes: 20, 30, 40, 50 and 75 KVA. Throat depth can be varied by a choice of 5 arm lengths: 12", 18", 24", 30" and 36". Thus, machine can be chosen to cover a range of capacities from 28—22 up to 28—11 gauge clean mild steel.

Write for descriptive bulletin No. 112-D

YES SIR! When the busy owner of a plant making electrical distribution equipment takes time out to sit down and write the above letter, he must have something to shout about.

It's the result of a long-standing conviction on the part of Sciaky Bros. that resistance welding is strictly a *production process*. Machines must therefore be designed to both, (1) produce sound welds and (2) stand up under continuous production conditions. To this end, Sciaky welders are engineered for *long life* and to be as *maintenance-free* as possible.

Furthermore, when you have trouble (and who doesn't, now and then), our service engineers are always on call to help out. We'd like to have the opportunity of proving "It's the Finest Welder ever Made" to you, too.

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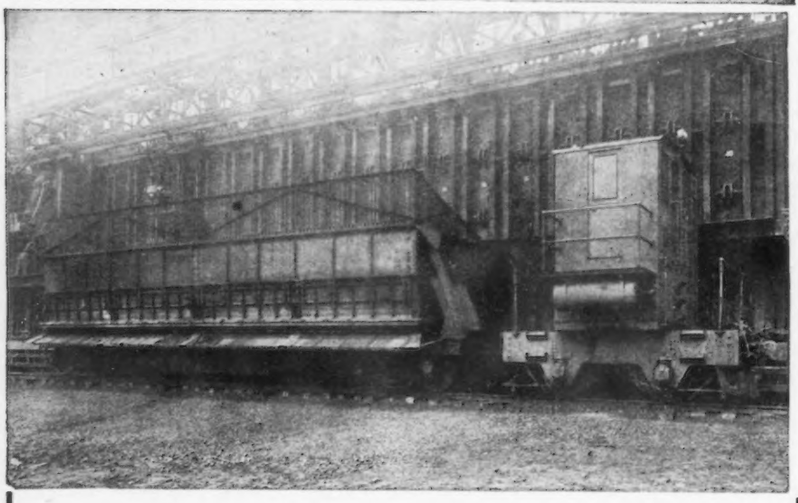

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The ATLAS CAR & MFG. CO.
ENGINEERS MANUFACTURERS
1100 IVANHOE RD. CLEVELAND, OHIO, U. S. A.

German Steel

(CONTINUED FROM PAGE 108)

it would appear that there is at least 14.5 million metric tons of steel capacity left in the British zone, which before the war was producing 80 pct of Germany's steel. In the official British reports about 4.3 million tons included in the 14.5 is "superficially damaged." This accounting leaves out about 6.7 million tons in the zone which the British reports describe as "demolished."

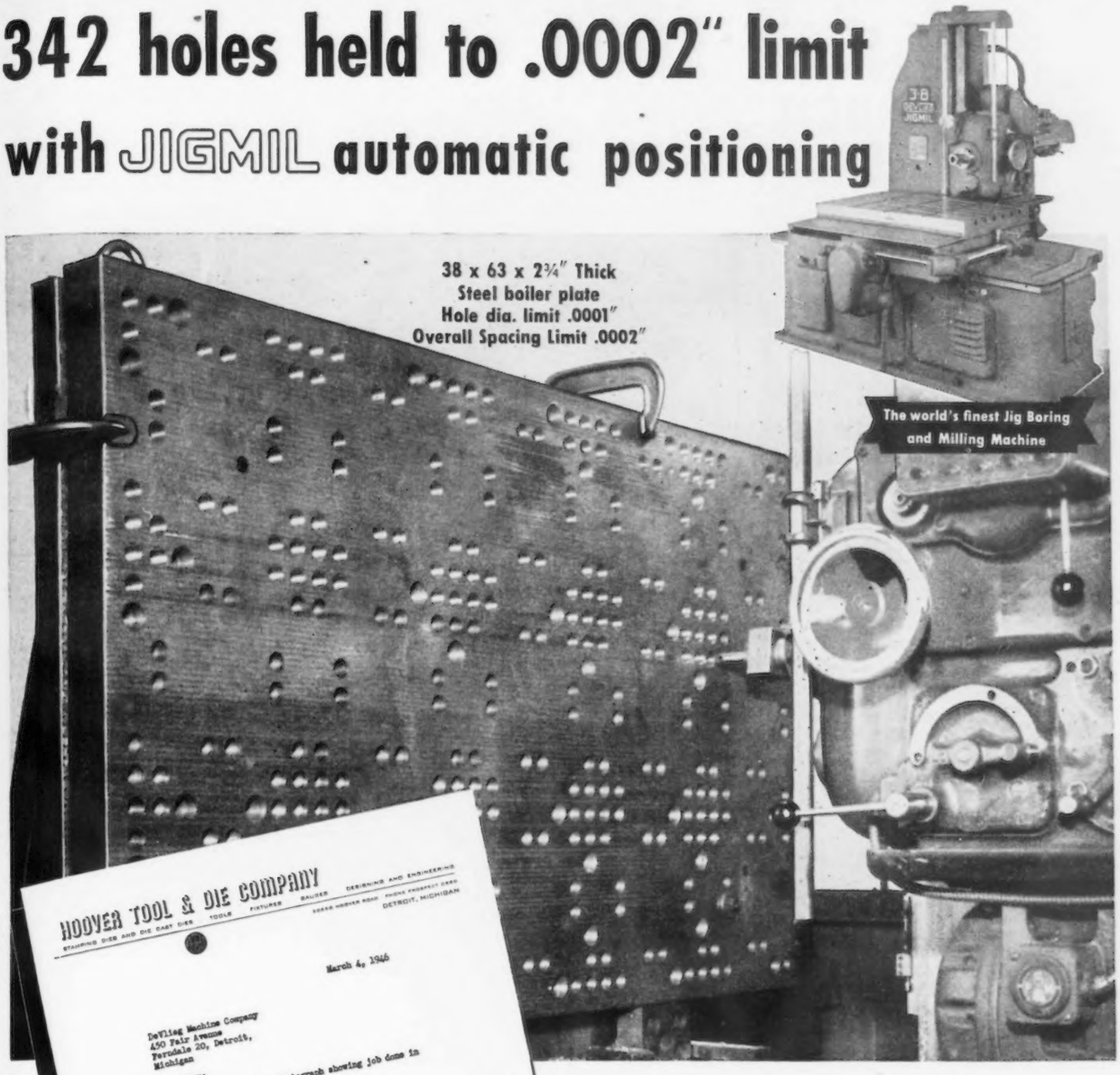
From the above it may be seen that at least 2.7 million tons of virtually undamaged steel capacity are doomed to departure from the British zone, or destruction. To this total, 4.3 million tons of only slightly damaged capacity must be added. And these figures are a bare minimum, assuming that all steel reparations will come from the British zone. Such a removal would mean separating from Germany a steel industry roughly equaling the output of all of France in 1936.

The whole industry plan uses 1949 as a target year for German reconstruction. The fond hope of the Four Powers is that the balance of exports and imports will have been reached by that time. To reach this balance and thus be able to pay for food imports, it will be essential that all permitted industries reach their top limits by that year.

The value of exports planned for Germany in 1949 is 3 billion Reichsmarks (at their 1936 value). The plan specifies that sufficient industry shall be permitted to remain in Germany to allow it to sustain this volume of exports, as well as to cover German domestic needs within the limits of a 1932 standard of living. These precepts were laid down in the Potsdam declaration.

Imports are to be strictly controlled by the Four-Power government, and will not be permitted to exceed the same figure, 3 billion 1936 marks. There is some difference of opinion among the experts as to just what this will do to the prewar volume of German imports. British authorities allege that Germany's 1936 imports amounted to 4.8 billions of marks, while American representatives

342 holes held to .0002" limit with JIGMIL automatic positioning


38 x 63 x 2¾" Thick
Steel boiler plate
Hole dia. limit .0001"
Overall Spacing Limit .0002"
The world's finest Jig Boring and Milling Machine

HOOVER TOOL & DIE COMPANY

STAMPING DIES AND DIE CAST DIES · TOOLS · FIXTURES · BALDER · DESIGNING AND ENGINEERING

DETROIT, MICHIGAN

March 4, 1946

DeVlieg Machine Company
450 Fair Avenue
Ferndale 20, Detroit,
Michigan

Gentlemen:

Enclosed is a photograph showing job done in our shop on the 3B Jig Mill.

PART: Master Plate
SIZE: 38 x 63 x 2-3/4" thick
MATERIAL: Steel Boiler Plate
HOLE DIA. LIMIT: .0001"
OVERALL SPACING LIMIT: .0002"

As machine table travel is 48", it was necessary to reset work. This did not affect accuracy and the time made was highly satisfactory.

Very truly yours,
HOOVER TOOL & DIE COMPANY
C. W. Richter
C. W. Richter - Vice President & Chief Engineer

CWR:B
Enc. 1

Here are the results obtained by one user of 3-B DeVlieg JIGMILS on a difficult boring operation. The JIGMIL will also cut costs in your plant because:

(1) Only one set-up required for both boring and milling operations.

(2) Centralized Push Button Control Panel and Slide Lock Levers operated through finger-tip pressure.

(3) Automatic spacing to within .0001" of setting permits unvarying accuracy on jigs, fixtures and duplicate parts.

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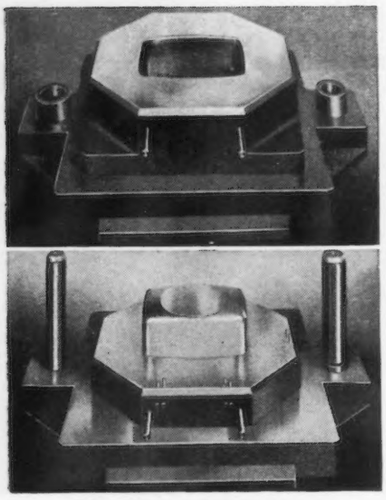

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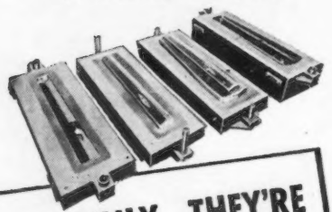

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By specifying **STRENES** metal you can get a cast-to-shape die casting that will require very little machining — and a die that will deliver far more pieces between redressings than you would normally expect.

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They will gladly discuss the time and cost savings and the greater production capacity of Strenes dies.

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Strenes METAL
FOR DRAWING AND FORMING DIES

claim that their total was only 4.2 billions.

There has also been considerable difficulty in estimating the exact postwar population of Germany. The base figure that has been used throughout all discussions is 66.5 millions, but this is admittedly no better than an educated guess. The broad scope of the migrations that have taken place since 1939 in Europe make any more accurate determination impossible today. As long as Germany must import food, the possibility that the population may be higher (and the British delegation is convinced that it is) threatens to throw the precarious import-export balance awry. If such an eventuality comes to pass,

TABLE III—Level of German Industry

Industries levels for which have been fixed or estimated for 1949

Industries from which reparations are not anticipated, but this possibility is not excluded if the Control Council decides that surpluses of industrial capital equipment are not required in Germany or for export and are suitable for reparations

Serial	Item	Production or Supply in Prewar Year	Estimated Level in 1949	Pct of Prewar Considered in Column 3	Remarks
(1)	Coal	208 million metric tons (1936)	155 million metric tons	75	Figures in hard coal equivalent. Until the Control Council otherwise decides, coal production will be maximized as far as mining supplies and transport will allow. The minimum production is estimated at 155 million ton (hard coal equivalent), including at least 45 million tons for export. The necessary supplies and services to this end will be arranged to give the maximum production of coal.
(2)	Main line locomotives	285 units (1936)	.....	..	Postwar level not fixed, all capacity to be engaged exclusively on repairs until 1949.
(3)	Freight cars	.....	30,000 units	..	
(4)	assenger coaches	.....	1,350 units	..	
(5)	Luggage vans	.....	400	..	
(6)	Agricultural machinery other other than tractors	Reichmarks 323 million (1938)	Reichmarks 258 million	80	
(7)	Mechanical engineering: (excl. agricultural engineering and ball and taper roller bearings)				
	a—Heavy engineering comprising: Metallurgical equipment, heavy mining machinery, material handling equipment, heavy power equipment, boilers, and turbines, prime movers, heavy compressors, turbo-blowers and pumps.	Reichmarks 1,394 million (1938)	Reichmarks 432 million	31	
	b—Light engineering and construction equipment comprising: Construction equipment, textile machinery, other consumers goods equipment, food processing equipment, chemical and refining equipment, materials processing equipment, small tools, woodworking machinery, gas welding and cutting machinery.	2,291 million (1938)	1,145 million	50	
	c—Machine tools	645 million (1938)	74 million	11.4	Machine tools to be limited as regards type and size by the Allied Control Authority.
	Total	4,330 million (1938)	1,651 million	38.1	
(8)	Precision instruments and optics	Reichmarks 491 million (1936)	Reichmarks 340 million	70	Including an estimated Reichmarks 120 million for export. A further limitation is possible for this industry depending upon the recommendation of the Committee for Liquidation of War Potential.
(9)	Agricultural tractors	13,900 units (1936)	10,000 units	72	Limited as regards capacity and type.
(10)	Private cars	245,000 units (1936)	40,000 units	16	
(11)	Commercial vehicles	59,000 units (1936)	40,000 units	67	
(12)	Light road tractors	.....	4,000 units	..	
(13)	Motor-bicycles	.....	10,000 units	..	Cylinder capacity 60 cc to 250 cc. Motor - bicycles with cylinder capacity over 250 cc to be prohibited.
(14)	Electrical engineering	Reichmarks 3,000 million (1938)	Reichmarks 1,500 million	50	Heavy electrical engineering comprises: (a) Generators and converters 6000 kw and over; (b) High tension switchgear; (c) Large transformers 1500 kva and over.
	Of which heavy electrical engineering	Reichmarks 130 million (1938)	Reichmarks 40 million	30	

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. . . the development of a sound and efficient handling system. In helping hundreds of organizations to install handling equipment, MERCURY has accumulated a wealth of experience that may be applied to your individual problems.

. . . provide you with the finest equipment. As a pioneer in the materials handling field, MERCURY has had over 35 years' experience designing and manufacturing handling equipment. This experience is engineered into every MERCURY product.

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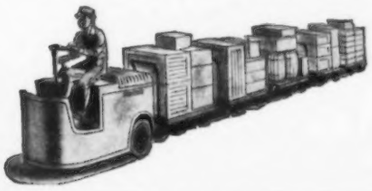
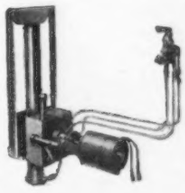
1. Originators of the "Trackless Train" system of materials handling. The fact that thousands of Mercury tractors and many times that number of Mercury trailers are serving throughout industry is evidence of the popularity of the "Trackless Train" system.



FREE — New MERCURY Catalogue
Write for your copy of Bulletin 201-6; the new Mercury "pocket-catalogue." Complete line of Mercury equipment illustrated with full specifications. Contains a wealth of information for the handling executive.

2. Mercury has pioneered and perfected many important industrial truck features. Those illustrated are standard on all Mercury fork trucks. While these features vary slightly on Mercury platform trucks, the basic principles are the same—



Hydraulic Hoist: No power required to lower load, no power wasted in lifting. Less than 50% of the usual moving parts.

Snap-action cam operated controller: Eliminates injurious arcing. Reduces maintenance to the minimum.

Unit constructed drive assembly: Motor and drive are one unit. Double reduction spiral bevel and spur gears transmit maximum power.

All welded frame: No rivets to weaken sections. Exterior is smooth and pleasing in appearance.

THE MERCURY MANUFACTURING COMPANY
4144 South Halsted Street, Chicago 9, Illinois

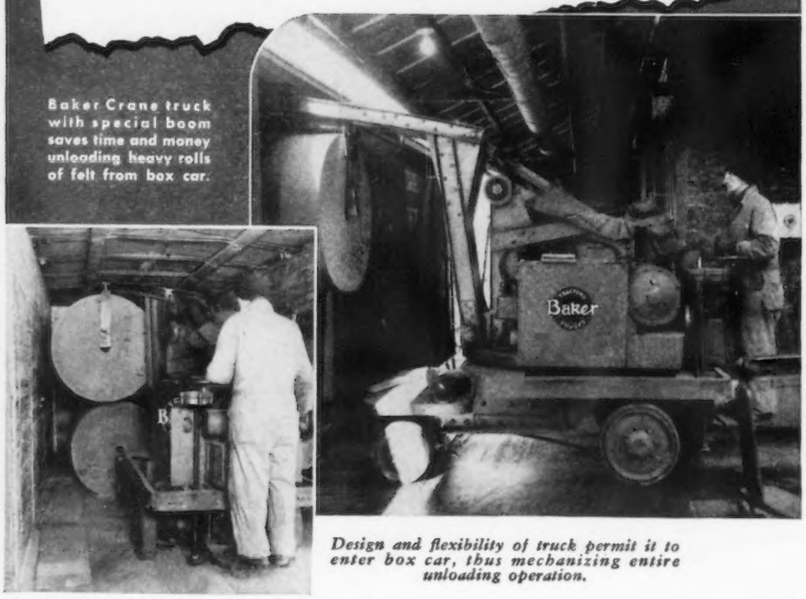
THE TRACKLESS TRAIN

MERCURY

TRACTORS TRAILERS • LIFT TRUCKS

Baker Truck

CUTS HANDLING COST $28,800 PER YEAR



Design and flexibility of truck permit it to enter box car, thus mechanizing entire unloading operation.

A floor-covering manufacturer reduced the man-hours required for handling heavy bulky rolls of felt by ⅔, and made actual savings of $96.00 a day by installing a Baker Crane Truck with special boom. His truck makes a simple task of unloading these rolls from box cars, moving them to storage and later to production . . . Besides the actual money savings, the truck enabled the manufacturer to make better use of warehouse space by tiering, to speed movement of materials in storage and production departments, to reduce damage to material from handling, and to make the job safer and easier for workers.

If lowering production costs to meet price ceilings is your problem, Baker Trucks may provide the answer. Consult your nearest Baker representative or write us direct.

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2175 West 25th Street • Cleveland, Ohio
In Canada: Railway and Power Engineering Corporation, Limited

EITA *Member: Electric Industrial Truck Association*

Baker INDUSTRIAL TRUCKS

we will have one more reason for overhauling the industry plan.

Among the interesting assumptions that the program makes is that Germany's goods will be universally acceptable in world markets, and indeed that world economic conditions will be such that all available goods can be sold.

Although ignored in the statement of the plan, the specter of widespread unemployment in Germany weighed heavily on the minds of the men who were drawing it up. The possibility that economic unrest as a result of widespread dislocations of labor would lead in a few years to a repetition of the rise of Nazism casts much gloom.

From the British viewpoint the plan as it stands will certainly result in a large unemployment problem, at least during a long transitional period. It is tacitly assumed in the program that large numbers of Germans who have been industrial workers will take up agricultural pursuits in the drive to expand food production, and that the reconstruction of German cities will also occupy abnormally large numbers of otherwise idle citizens.

In line with the decisions previously announced the industries listed in table I are to be completely removed from the German way of life. In addition, two categories of industries which will be restricted were also announced. Table II lists those industries being restricted and from which reparations are already being extracted. Table III lists those which are not being used for reparations at present, but which may be if there are excesses of capital equipment above German domestic and export needs.

Aluminum, alumina, and magnesium fall into the prohibited class, while steel and most of the other nonferrous industries fall into the restricted category.

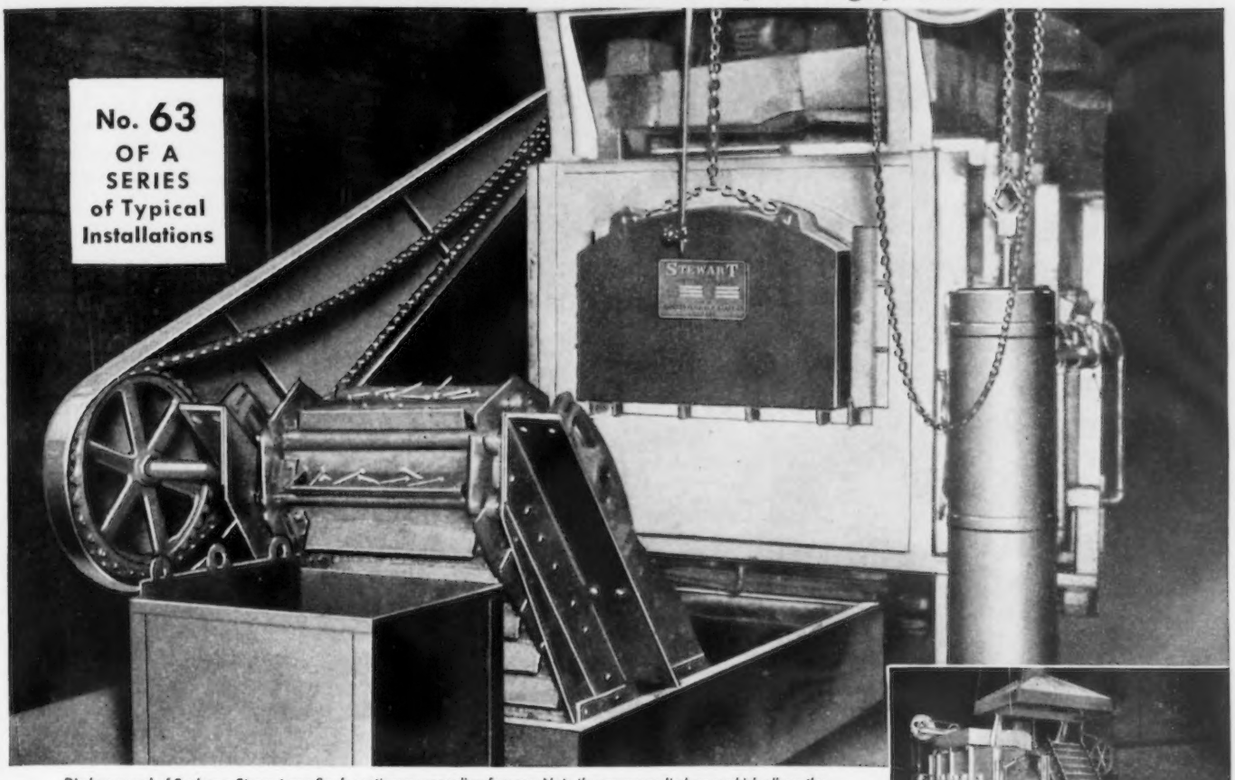
Limitations on the machine tool industry are particularly drastic. The general cut is to 11.4 pct of the 1938 machine tool capacity with additional restrictions to be placed on the type and size of machines to be produced. Certain classes of heavy tools (yet to be defined by the Control Authority) are to be barred completely.

In recognition of the need to expand agricultural production and to get the internal transport system in Germany on wheels the industries supplying them will be favored to the extent of being allowed to produce up to domestic needs.

Sunbeam
STEWART
THE BEST INDUSTRIAL FURNACES MADE

For CONTINUOUS AUTOMATIC ANNEALING OF BOLTS

at BOSS BOLT AND NUT COMPANY, Chicago, Illinois



Discharge end of Sunbeam Stewart gas-fired, continuous annealing furnace. Note the conveyor discharge which allows the bolts to fall into hoppers, permitting economical and efficient handling.

For the important annealing job on all their cold-forged bolts, the Boss Bolt and Nut Co., division of Lock Nut Corp. of America, uses a Sunbeam Stewart conveyor-type furnace operating on a continuous production basis. This Sunbeam Stewart installation anneals efficiently and economically approximately 1500 lbs. of bolts of all shapes and sizes an hour.

In bolts that are cold-forged, work-hardness and strain resulting from the forging operation must be removed and the maximum toughness, increased accuracy, and easy machinability required in the threading operation retained.

By means of the variable speed drive, the heating cycle can be controlled as desired. The furnace atmosphere can also be adjusted by valves controlling the gas-air ratio. Annealing temperatures are controlled by fully automatic standard temperature control equipment.

This installation is typical of the industrial furnaces Sunbeam Stewart engineers are building every day to meet the specified requirements of manufacturers all over the continent. Sunbeam Stewart builds, in addition, a full line of standard furnaces.

For easy loading and charging, bolts to be annealed are shoveled into a bucket-type conveyor at floor level.

FREE ON REQUEST

STEWART VEST-POCKET HEAT TREATING DATA BOOK

Seventy-two pages of charts, tables, diagrams, factual data . . . ready reference book for all types of engineers. Write Sunbeam Stewart, Dept. 110 for your personal copy.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(*Formerly* CHICAGO FLEXIBLE SHAFT CO.)

Main Office: **4433 Ogden Ave., Chicago 23, Ill.—*Canada Factory:* 321 Weston Rd., So., Toronto 9**

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

VAPOR DEGREASING PLUS

Even though solvent vapor degreasing has been used successfully on thousands of applications it is not considered a "cure all" for all metal cleaning problems. A combination of Detrex processes is often the answer. Here is a case where a Triad Emulsion was used with vapor degreasing.

the Problem

The removal of residual solids remaining from drawing compounds after vapor degreasing was the problem. Hand wiping costs were running $100 a day.

the Answer

A Detrex field representative recommended a predip of Triad 93 and fuel oil at room temperature. The drawing compounds were completely wet out in this solution, then were removed in the degreaser.

THE RESULT

The work came out 100% clean—no smut, no dirt, no residue. Hand wiping costs were eliminated and production was speeded up.

Detrex field representatives can suggest cleaning processes to answer your individual problem. Consult one today.

DETREX Corporation
DETROIT 27 • MICHIGAN

Hood Succeeded By Canaday As Head Of Army Ordnance Post

Cleveland

• • • **Ward M. Canaday,** Toledo industrialist, has been elected president of the Cleveland Post, Army Ordnance Association, according to an announcement by C. F. Hood, retiring president of the group.

Mr. Canaday, chairman of the finance committee of Willys-Overland Motors, Inc., recently its board chairman and formerly its president, has been prominent in Ordnance Association activities, both nationally and in the Cleveland Post. He formerly was a director and vice president of the district group. Mr. Hood, president of American Steel & Wire Co., Cleveland, has been president of the Ordnance post since its organization in Oct., 1940.

John C. McHannan, chairman of the board of Central National Bank, Cleveland, was re-elected first vice president of the Ordnance group. Col. E. A. Lynn, Chief of the War Department's Cleveland Ordnance District, is secretary-treasurer.

The Cleveland post of the Army Ordnance Association is made up of more than 5800 members identified with business and industry in the Cleveland Ordnance District, which embraces the northern two-thirds of Ohio and part of northwestern Pennsylvania. It was organized for the purpose of stimulating closer cooperation between Army Ordnance and industry.

In assuming the presidency of the group at a meeting of directors in Cleveland, Mr. Canaday said:

"It is an honor to serve this association, which has before it now the constant challenge to work just as closely with the development of Army Ordnance in time of peace as in time of war. During the war, the Ordnance-industry team accomplished production miracles that made victory possible. Now, in time of peace, our objective must continue to be industrial preparedness and understanding of ordnance problems and progress. This is the most effective preventive of war."

Mr. Canaday is given a major

FOR INCREASED TOOL LIFE—
LOW COST—ACCURATE PARTS USE
J&L COLD FINISHED STEEL

Your automatic screw machines will operate longer between tool changes when you use J&L Cold Finished steel. The uniform Controlled Quality of J&L Cold Finished rounds, hexagons and squares makes it possible for you to set the speed of your machines to obtain maximum efficiency. In addition the close dimensions and inherent machinability of J&L Cold Finished bars will make it possible to produce, at low cost, accurate, highly finished parts.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

J&L STEEL

Get Samples of This New and Different Disk with the Bonded Triple-ply Backing!

Amazingly durable! That's what grinder operators say about Weldisk! And they find that this modern, in-built durability is matched by other amazing qualities.

★ Out-performs ordinary disks by as much as two-to-one! *Reason* – a remarkable new cold-setting cement bond – not glue or resin – developed in the wartime electronics program assures a permanence that actually improves with age!

★ Lies flat without curling or warping! *Reason* – a new seasoning technique that produces absolutely flat disks which grind evenly during long service life!

★ Does not soften up at the shoulders, break up and endanger the operator with flying pieces. *Reason* – it's the only disk with triple-ply backing of fibre for stiffness and two layers of cloth for strength.

PROVE IT WITH A SAMPLE – Make your own "show me" trial. See how Weldisk cuts rapidly, does not load, runs cool, will not "blue" the work, gives a fine finish with less labor. State size of disk, grade of grit, and brief description of work to be done – and a sample disk will be sent without obligation to you.

Abrasive Products, Inc.

SOUTH BRAINTREE 85, MASSACHUSETTS · MAKERS OF JEWEL COATED ABRASIVES

share of the credit for the reorganization of Willys-Overland Motors in 1936 as well as much of the credit for the quick transition to war products made by the company after Pearl Harbor, and its creation of more than three quarters of a billion dollars worth of war material, headed by the Willys jeep.

The Willys-Overland plant, a major producer of ordnance material in the Cleveland district, was largely instrumental in making the immediate Toledo area one of the banner areas in the district. Toledo industrialists, aware of the necessity for continuing close liaison between industry and the military, also produced proportionately the largest number of new members for the association in the campaign of a year ago.

Additions to CPA List

Washington

• • • **Warm-air furnaces** and copper magnet wire have been added to CPA's list of items in critically short supply and the agency will grant priorities assistance to maintain and increase production.

Makers of these commodities may now apply for CC preference ratings; also, producers of specialized machinery necessary to the manufacture of asphalt and tarred roofing products, building and gypsum board and lath are eligible for CC ratings.

Eligibility for the CC preference ratings differ between the various products according to needs of the industries, CPA said. All items except the wire are directly needed for housing and construction; the wire is required for many electrical products including washing machines, refrigerators and other items which also enter into the housing picture.

OPA Plans Cash Sales

Washington

• • • **Announcement** will be made shortly by WAA of a nation-wide series of "cash-and-carry" fixed price sales involving $1.5 billion worth of capital, producers and consumer goods. Officials said that more than 500 sites are presently under consideration in virtually every section of the country.

Gallup Polls

(CONTINUED FROM PAGE 109)

favor the merger. This is an opinion also held by a majority of Democrats with opinions on the issue. Sentiment here is concerned with the principle and does not presume to apply to the specific merger proposals recently put forward in Congress.

Draft Extension — Continuing the Selective Service draft, with draftees required to serve 1 yr, gets an o.k. from Republicans who have also long been in favor of a program for peacetime military training of young men.

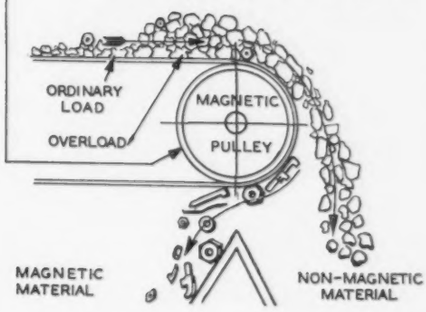
British Loan—There is some difference of opinion among Republicans and Democrats over the proposed British loan. Generally speaking, Republican voters are less in favor of it than Democrats. Among Republicans who have heard or read about the loan and have an opinion about it, 38 pct favor granting the loan, and 62 pct are opposed. Among Democrats the comparable vote is 46 pct in favor, and 54 pct opposed.

UN—The squabbles in the UN and the difficulties encountered by the United States in dealing with other powers have not altered Republican voter sentiment about cooperating in world affairs. There has been no postwar drift toward isolationist sentiment among the party's rank and file. A survey conducted during the UN crisis over Iran found almost three out of every four Republicans (72 pct) wanting the United States to take an active part in world affairs, rather than try to stay out of world affairs.

The fact that Republicans support world cooperation to the same extent as Democrats tends to refute an argument of Secretary Henry A. Wallace that a Republican victory this autumn would lead to a return to isolationism.

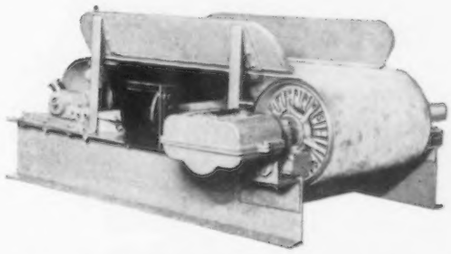
Russia—Republicans are strong in their disapproval of the course Russia was taking in world affairs before the Iranian crisis was eased. The rank and file of the party feel that if Russia persists in that course, the United States should maintain a firm policy, make Russia stick to her agreements, and show her no appeasement. The average Democrat feels about the same way, polls show.

PROTECT AGAINST TRAMP IRON MENACE



with STEARNS Magnetic Pulleys and Pulley Separators

Avoid damage to crushers, grinders, pulverizers and machinery, possible costly shutdowns, injuries to employes by installing Stearns (air-cooled for more power) Magnetic Pulleys. Your best low expense, effective and automatic insurance against the tramp iron nuisance. In all sizes to serve as head pulleys in your conveying system.



Completely self-contained Magnetic Pulley type Separators with belt, tail pulley, frame—or with two magnetic pulleys, depending upon your capacity and separation desired.

STEARNS MAGNETIC MANUFACTURING COMPANY

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ERIE BUCKETS

- General Purpose
- Dredging and Hard Digging
- Dragline
- Material Handlers
- Hook-on Type
- Ore Handling
- Coal and Coke
- 4-Rope
- Barge Type
- Strayer Electric

Above types built in weights and capacities to suit your crane and job requirements.

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ERIE STEEL CONSTRUCTION CO.

ERIE, PENNSYLVANIA

Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

Wherever **WIRE ROPE** *is used for Tough Jobs . . .* **THERE** *is the Proving Ground for*

"HERCULES"

(Red Strand)

Since the first length of "HERCULES" (Red Strand) Wire Rope was produced, it has continued to increase its many uses in one industry after the other, until today, no matter what 'tough job' is in the offing, "HERCULES" can do it . . . proving its strength, toughness, elasticity, durability and adaptability.

There is a type and construction to fit every wire rope requirement, whether Round Strand or Flattened Strand—Preformed or Non-preformed.

Our Engineering Department will gladly submit detailed recommendations for any Wire Rope job! Just ask us.

MADE ONLY BY

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SEATTLE 4 . . . 3410 First Avenue South

The London Economist

(CONTINUED FROM PAGE 115)

American political and economic structures remains to be seen, but its history so far is hopeful.

That its present incarnation was not foreseen and plans made earlier for handling it is unfortunate, but not surprising. The American genius is still for improvising in the midst of emergencies, with all the attendant waste and comfort that implies, and planners are still suspect. In that process the national aptitude for invention has its happiest exercise, and even in the dim field of State Dept. administration this skill does show itself, though it may take 12 yr, and a pressure on the part of other cabinet departments which have learned to speak sooner, before it manifests itself.

WITH the task of absorbing bulges now under way, the ostrich is paying some slight attention to the sands of leisurely meditation. The function of formulating and pronouncing on foreign affairs is, of course, inherent in the State Dept., and in days when it took two weeks to travel from New York to Washington there was plenty of time to consider all aspects and make pronouncements. But in these latter days, when two weeks have become too long to travel around the world, the pronouncement has too often emerged into a vacuum left by the departure of the situation for which it was designed.

The demands for adequate and simultaneous reorganization of the Department's administrative structure still continue. Bit by bit hints of change leak out to the outside world. Of the forms and fictions sacred to traditional diplomacy which cling about the Department and might be thought to impede its needed spurts of speed the latest to vanish is a phrase. No longer do memoranda sent to other cabinet departments read: "The Secretary of State presents his compliments to the Honorable the Secretary of ——and has the honor to transmit . . ." The number of woman-hours per working day spent in typing out that spacious form of address has been noted by the reorganizers. Very recently a new order came down. The Secretary of State still "has the honor to transmit . . ." but the compliments have yielded to the times.

Howard Taylor First Recipient of AFA's Simpson Gold Medal

Chicago

• • • **Establishment** of a new medal recognizing meritorious achievement in the foundry field, the Peter L. Simpson Gold Medal of the American Foundrymen's Assn., is announced by Fred J. Walls of Detroit, president of the society.

Fifth of the association's gold medal awards, the new medal, founded as a memorial to the late Peter L. Simpson, first president of the National Engineering Co., Chicago, was established by the recent endowment of an award fund by that firm, of which H. L. Simpson, a past president of AFA, is chairman of the board.

The memorial medal will be awarded for the first time at the 50th anniversary foundry congress of the association in Cleveland, May 6 to 10. First recipient will be Howard F. Taylor, formerly of Naval Research Laboratory, and now research associate at Massachusetts Institute of Technology, Cambridge, Mass., chosen "for his unfailing interest in and contributions to foundry research and his influence on the broadening of naval research in the field of cast metals."

Acceptance by the AFA board of directors of the award fund was accompanied by a motion stating that "AFA accepts with gratitude the generous offer of H. S. Simpson to endow an AFA Memorial Fund in memory of the late Peter L. Simpson, and that a special committee of the board is appointed to confer with the donor at the earliest possible date to the end that the greatest good be accomplished for the foundry industry in honoring one of its outstanding pioneers."

The award agreement includes all the general conditions of the association's John H. Whiting, John A. Penton, William H. McFadden and Joseph S. Seaman gold medal awards which have been periodically bestowed since 1924-25. The new award differs, however, in the intention that the medal shall be conferred each year upon an individual "who shall, by his individual effort, achieve some noteworthy results toward

Spare Parts for famous LVT Water Buffalo

RUST-PROOFED WITH TECTYL

Water Buffalo—Amphibious Tank—Official U. S. Navy Photo

Assigned to handle the packing and shipment of spare parts for the entire LVT program, the Food Machinery Corporation, Riverside Division, chose Tectyl 502 for the vital job of rust prevention. Despite the hazards of overseas shipment—Tectyl brought those parts through in perfect condition.

Methods of applying TECTYL at FOOD MACHINERY CORPORATION

Riverside Division - Riverside Calif.

1. *Large parts, requiring full coverage, placed in racks and sprayed.* →

2. *Brush application used on bulky parts for protection of unpainted portions only.* ←

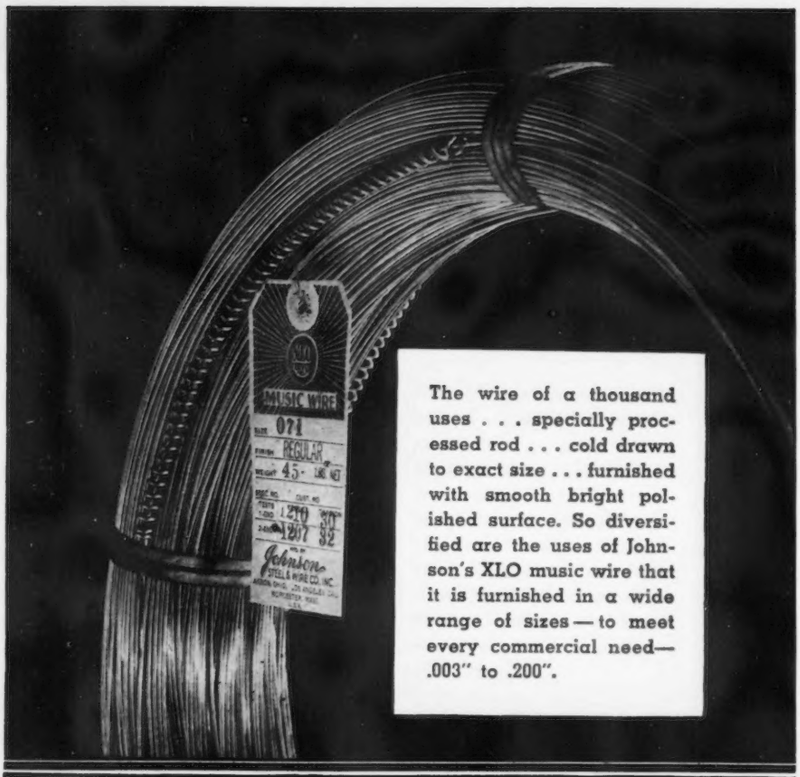
3. *Small parts and tools placed in wire baskets and dipped. All applications made with Tectyl 502 Rust Preventive.* →

There's a Tectyl Solution for every rust problem—For specific recommendations on use of Tectyl in your plant, write or wire, giving details of your products and types of exposure encountered.

VALVOLINE TECTYL *ENDS RUST*

FREEDOM-VALVOLINE OIL COMPANY

Dept. 25D, Freedom, Pa.—Cincinnati - New York - Washington - Toronto - Pittsburgh - Atlanta Detroit - Chicago - Los Angeles - San Francisco - Portland - Seattle - Vancouver, B. C.



The wire of a thousand uses . . . specially processed rod . . . cold drawn to exact size . . . furnished with smooth bright polished surface. So diversified are the uses of Johnson's XLO music wire that it is furnished in a wide range of sizes — to meet every commercial need— .003" to .200".

JOHNSON STEEL & WIRE CO., INC.
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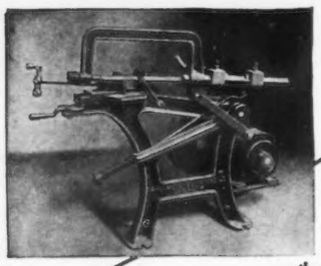
NEW YORK AKRON DETROIT CHICAGO LOS ANGELES TORONTO

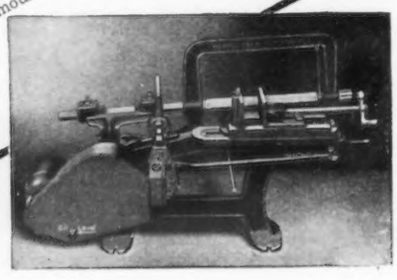


80% *of all Small Shop Saws are "Marvels"!*

No. 1 Draw Cut Hack Saw Dry cut, 4" x 4" capacity. A sturdy saw well-known for its dependability, economy, and invaluable service in the small shop or shop department. Simple and efficient with low original, maintenance, and blade cost.

MARVEL SAWS

No. 2 Draw Cut Hack Saw. Companion to the No. 1 but with a normal 6" x 6" capacity which can be increased to 8" x 8" by shortening the stroke with adjustable crank. The No. 2 MARVEL also has a swivel vise which is removable from the "T" slotted bed. Special fixtures to be mounted. Both mitting machines are available in belt and motor driven models. Motor driven models can also be furnished mounted on portable truck.



Complete Range of Metal Sawing Machines
Being the largest exclusive manufacturer of metal sawing machines and blades, both hack saw and band saw type, we have the correct answer to your cut-off problems. Each MARVEL model has a distinct application, so write us and we will send our catalog, price, and recommendation for the saw to fill your requirements most efficiently. MARVEL sawing engineers are also available to discuss and analyze your cut-off work. (Without obligation of course)

ARMSTRONG-BLUM MFG. CO.
5700 Bloomingdale Ave., Chicago 39, Illinois, U.S.A.

achievement of those objects for which the association was formed." Thus the medal is to be conferred annually for meritorious achievement within the year preceding each AFA annual meeting. Decision as to achievements deemed worthy of recognition rests with the AFA board of awards which consists of the last seven living past presidents of the association.

Controllers Group Elects

New York

• • • **Six new members** from the metals industry have been elected by the Controllers Institute of America—Harry J. Longeway, controller of Michigan Steel Tube Products Co., Hamtramck, Mich.; Willard E. Roberts, controller of the Carpenter Steel Co., Reading, Pa.; Robert F. Schutz, controller, Ingersoll Steel & Disc Div., Borg-Warner Corp., Kalamazoo, Mich.; Anthony von Wening, vice-president and controller of A. O. Smith Corp., Milwaukee; Henry I. Barclay, Jr., controller of Continental Gin Co., Birmingham; and William F. Staegemann, controller of Graver Tank & Mfg. Co., Inc., East Chicago, Ind.

Metals to Pace Exports

London

• • • **Britain will rely** particularly upon the metal and engineering industries in the present drive for export trade, according to the Prime Minister in a speech he made at the annual dinner of the Birmingham Jewelers' & Silversmiths' Assn.

Skilled brains must be used to meet present needs, and in the war against want which is now being waged those responsible for the management of industry must make as full use of the scientists as did the War Cabinet in the fight for freedom.

The workers must be disciplined, but it is necessary to have the right kind of leaders in management. Strength must not be wasted in quarrels over wages, hours and conditions, and stoppages in industry must be avoided.

Mr. Atlee concluded by saying that, despite the many difficulties ahead, he looked forward with confidence to the future.

Firm Develops New Stainless Channels

Ft. Wayne

• • • **Joslyn Mfg. & Supply Co.,** Fort Wayne, Ind., announces the addition of stainless steel channels to its regular lines of stainless steel ingots, billets, bars and shapes. The new product was developed as a companion item to the company's stainless steel angles and has broad application in metal fabricating.

The channels are produced hot-rolled, annealed and pickled in AISI Types 302, 304 and 316. Sizes are from ¾x⅜x⅛ in. to 2½x⅝x-¼ in. cut to any length desired. They have attractive finish, high tensile strength and great resistance to corrosion and heat.

Distribution of the new product is handled through the company's regular factory representatives and salesmen.

Engineering Educators To Confer New Award

New York

• • • **This year,** for the first time, a new award of $1000 will be given to the college or university teacher adjudged to have contributed most to the successful teaching of engineering students, it was announced here recently by The Society for the Promotion of Engineering Education.

The prize, to be conferred annually, will be known as the George Westinghouse Award in Engineering Education. Established to commemorate the 100th anniversary of the birth of the famed inventor, the award has been made possible by the Westinghouse Educational Foundation.

In announcing the plan, Dr. Harry S. Rogers, president of the Society for the Promotion of Engineering Education and president of the Polytechnic Institute of Brooklyn, made clear that while there are no age limitations in making the award, "consideration will be given especially to the younger men who show by their past record evidence of continuing activity as superior teachers."

Dr. F. L. Bishop, secretary of the S.P.E.E. for the past 32 yr, has distributed nomination forms to the deans of the 165 engineering

Yes, little Waldo knows it's smart to protect the side that's exposed. Some day, when he's specifying materials for plant equipment, one of his "musts" will be IngAclad Stainless-Clad Steel. For this famous, time-tested Borg-Warner product provides full stainless protection on the side that's going to "take it."

Easier to fabricate than solid stainless . . . provides better heat diffusion in vessels where heat is applied . . . cuts material costs way down.

Proved by 14 years of continuous service. We also produce Solid Stainless and Heat-Resisting Steels. Write, wire or telephone—no obligation.

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Corning Glass Works
E. I. DuPont de Nemours Co.
Firestone Tire & Rubber Co.
Graver Tank & Mfg. Co.
Groen Mfg. Co.
Leader Iron Works
Monsanto Chemical Co.
Procter & Gamble Co.
Sherwin-Williams Co.
Solvay Process Co.
United States Potash Co.
Whiting Corp.
and many others

For COMPLETE Hoist "KNOW-HOW"

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schools of the country and to the officers and executives of the committees of the society and related national engineering societies. Presentation of the award and the engraved certificate will take place at the annual dinner on Saturday evening, June 22, in the Jefferson Hotel in St. Louis where members of the S.P.E.E. will meet in their annual convention as guests of Washington University.

New Method of Dust Analysis Described

Chicago

• • • **Silica particles** so fine that more than 100 million can be piled on the head of a pin can now be sorted out of larger dust in factory air to more accurately control silicosis hazards, Francis R. Holden of Industrial Hygiene Foundation reported Apr. 11. Dr. Holden described this new method developed by the Foundation at Mellon Institute, Pittsburgh, at the seventh annual meeting of the American Industrial Hygiene Assn. in session at the Sherman Hotel, Chicago. He said the procedure marks a further step in protecting the health of workers in dusty trades.

The finer the silica dust, Dr. Holden continued, the greater the danger because only microscopic particles smaller than 5 microns are likely to damage the deep lungs. Particles larger than 5 microns, which is about the size of a red blood cell, are more readily trapped in the filter mechanism of the nose and throat.

Dr. Holden described the collecting, counting and analysis of dust in the dangerous size ranges. "Visible and invisible dust in the workplace is determined by condensing dust floating in atmosphere equivalent in size to a small room, into a capsule-sized sample. This is done by drawing a measured volume of air through a salicylic acid. The acid is then dissolved in alcohol and the dust sample remains."

Through a process of sedimentation the total dust sample is divided into particle sizes above and below 5 microns. After the smaller particles have been counted and analyzed by X ray, the chemist can now determine the degree of a silica hazard with greater accuracy than formerly.

United Engineering To Lease DPC Plant

Pittsburgh

• • • **United Engineering &** Foundry Co., Pittsburgh, announced completion of negotiations with the War Assets Corp. for leasing the New Castle, Pa., plant.

K. C. Gardner, Sr., president of United, said the addition of the new facilities will double the peacetime capacity of the company for the production of rolling mill equipment, forging presses and general industrial machinery.

The New Castle plant was operated during the war as a Defense Plant Corp. unit. The lease is for 3 yr with two 1-yr options.

H. B. Cummings, superintendent at New Castle, said the plant is now fully reconverted. The 240 mm gun line has been disposed of and both the 6 and 8-in. shell lines used during the war have been dismantled, with about 70 pct of the equipment placed in storage, he said.

There are 1400 employees at the plant and Mr. Cummings said this force will be increased as fast as skilled men are available.

There is a substantial backlog of business for the plant and the outlook for the immediate future is good, he added. Much of the work now being done at New Castle is destined for automobile plants, Mr. Cummings said, and this equipment is being rushed.

British Plan to Diversify

London

• • • **Aneurin Bevan,** British Minister of Health, said at a regional production campaign conference at Cardiff that one of the first principles of the government's policy was that industries must be brought to the people and not the people sent to the industry.

In the South Wales area there are at present 70,000 out of work, but new factories are being built to provide employment for between 30,000 and 40,000. The government hopes during the next few years to succeed in diversifying employment in South Wales so that the area will no longer be dependent only upon the heavy industries.

Reports Britain Leads World in Development Of Jet Propulsion

London

• • • **The British** aircraft industry is ahead of the rest of the world in the development of jet propulsion which may, according to a recent article in the *London Financial Times*, be adapted for civil aviation within the next few years.

During the past six months the British industry has been working on its reconversion program. Nine to twelve months may elapse before all the war contracts are finished, and the *Financial Times* estimates that in its established peacetime structure the industry will probably be working up to 75 pct on Air Ministry contracts with the balance for civil aircraft and exports. Since the end of the war and the consequent drop in government orders, many factories have been undertaking other work from constructing aluminum houses to household appliances.

At the present time there is a wide range of civil air transports under construction. Some of these are on order for the British Government and others are for export; South America is particularly interested in British aircraft.

Britain is confident of being able before long to offer strong competition to the United States in the civil transport field. Other possible rivals will be Russia, who is expected to supply most of the eastern European countries, and France where the industry is practically nationalized and is producing Junker transports.

Foreign military orders are helping to bridge the present production gap in Britain. The Norwegian Air Force is being reorganized with British machines, and Fairey Aviation is supplying the Dutch Navy with Fleet Air Arm types—the Firefly and Spearfish aircraft of this company are very highly rated. Sweden is buying the De Havilland jet aircraft, the Vampire, and has secured a license to manufacture the De Havilland jet engine.

Although the De Havilland Co. military output is decreasing, it still predominates on the production line. Increased production of civilian planes will become well apparent by the end of the year.

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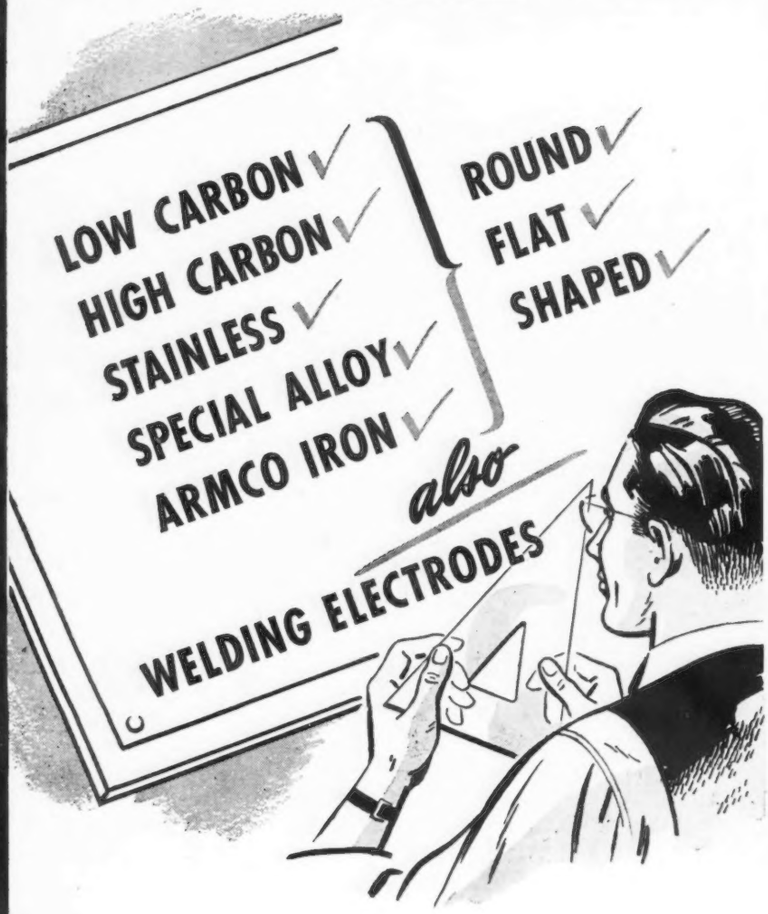

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The Dove aircraft which this company is producing is considered a promising light civil transport type.

The nonaircraft work is chiefly of a temporary nature but must not be overlooked. The production line technique of Blackburn, Bristol at Weston, and Vickers-Armstrong at Blackpool has proved very suitable for conversion to the manufacture of aluminum houses, and General Aircraft is making prefabricated houses, water pumps and furniture. Miles is producing fountain pens and photostat equipment, and Follands, electric trucks and parts for prefabricated houses such as bathroom units. Cigarette cases are among the items being manufactured by the Bristol light casting dept., and Fairey has developed production of certain specialized tools. About 75 pct of the factory space of Parnall Aircraft is devoted to the production of household appliances, but on the other hand De Havilland and Handley Page are engaged entirely in aircraft manufacture.

Timken-Detroit Brings Out New Truck Axle

Pittsburgh

• • • **A lightweight,** heavy duty truck axle with aluminum housing, hubs and brake shoes has been brought out by the Timken-Detroit Axle Co., Detroit. Timken's announcement of the commercial production of the new axle, called the "S-200-P," marks the first time that aluminum axles have been offered by any axle builder as a standard line of equipment.

The aluminum rear axle is designed for heavy duty hauling in cities and states allowing over 18,000 lb at the tires on the ground per axle. The "S-200-P" axle is available with two types of final drives: Hypoid-helical double-reduction and 2-speed hypoid-helical double-reduction. Each type of final drive is interchangeable in the same axle housing using the same axle shaft.

With aluminum construction, the "S200-P" weighs 220 lb less than the same unit equipped with malleable iron parts. In announcing the weight saved through the substitution of aluminum, Timken president Walter Rockwell said, "This reduction in unsprung

weight should lengthen tire life considerably, and also improve the riding qualities of the truck, particularly when lighter loads are to be carried at high speeds. Although the aluminum axle will cost a little more than the conventional axle, truck operators should be able to write off this increased cost in a reasonably short time because the reduction in dead weight will permit them to carry more pay load."

Reopens McKeesport Plant

McKeesport

• • • **Jones & Laughlin** Steel Corp., plans to reopen its McKeesport plant within the next two months as a fabricating division, according to H. E. Lewis, president. The plant will have a separate works status instead of being an operation of the company's Pittsburgh works. The plant will be used for the fabrication of river barges, railroad cars, and mine cars, mainly for the company's own use. The fabricating facilities of the company will be centered at McKeesport to finish steel produced by Jones & Laughlin.

The reopening depends largely upon how quickly government-owned equipment is moved from the plant. Eventual employment is expected to reach 800 to 1000. During the war, the plant produced more than five million shells, mainly 105-mm and 8-in. types.

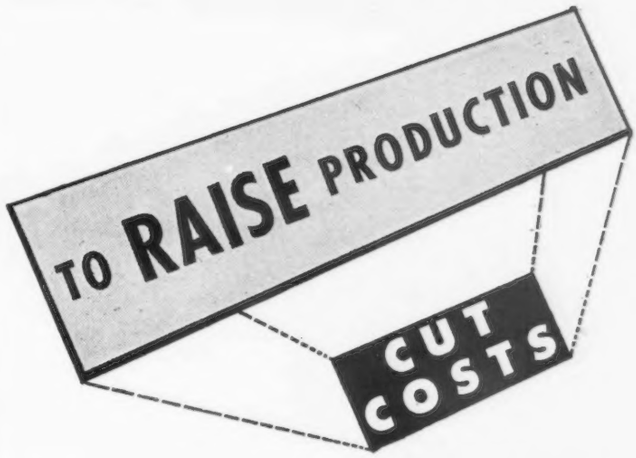
Moves Ballbearing Plant

London

• • • **Germany's most** important ballbearing plant has been transferred from Schweinfurt, Bavaria, to Thuringa in the Russian zone of Germany, according to Dr. Paul, State president of Thuringa.

The Kugel-Fischer ballbearing plant at Schweinfurt in the American zone was included in the first list of allocations of plants available as advance deliveries on account of reparations, one half of it being allotted to Russia and the other half to the other allied nations.

Under the Potsdam agreement it was decided that 10 pct of such industrial capital equipment in the western zones as was unnecessary for German peacetime economy should be transferred to the Soviet Government with no stipulation regarding disposal.



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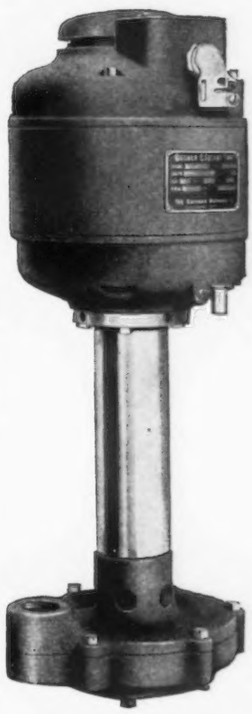

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ASHVE Acquires New Research Facilities To Assist Industry

Cleveland

• • • **The American Society** of Heating & Ventilating Engineers, in a move to provide adequate research facilities for serving the heating, ventilating and air conditioning industry as well as associated industries, has purchased a 2-story brick building here, containing 10,000 sq ft of floor space.

Alfred J. Offner, ASHVE president, said the move to the new home for the society's research laboratory was effective April 1, and represents another forward step in the group's research program, now in its 27th year.

Psychometric rooms, used in studies on human comfort, radiant heating, and radiant cooling, as well as studies in airflow and air distribution, will be located on the second floor of the building. Other research facilities, a workshop and storage rooms will be located on the first floor. A large unshaded area at the rear of the laboratory will be used for erection of equipment for the study of solar radiation and associated problems.

Attached to the laboratory is a 3-story dwelling which provides office space for the staff which includes: Cyril Tasker, director of research, assisted by C. M. Humphreys, senior engineer; H. B. Nottage, G. V. Parmelee; Dr. A. D. Brandt, assigned to the Society's laboratory by the U. S. Public Health Service and a group composed of research assistants, technicians and clerical aids.

All of the Society's research work is administered by the ASHVE Committee on Research, consisting of: L. P. Saunders, chairman, Lockport, N. Y.; Capt. T. H. Urdahl, USNR, vice-chairman, Washington, D. C.; Dr. A. C. Fieldner, ex-officio, Washington, D. C.; C. M. Ashley, Syracuse; Prof. F. E. Giesecke, New Braunfels, Texas; F. C. McIntosh, Pittsburgh; Prof. G. L. Tuve, Cleveland; R. M. Conner, Cleveland; Dean J. A. Goff, Philadelphia; Prof. F. W. Hutchinson, Lafayette, Ind.; R. K. Thulman, Washington; W. E. Zieber, York, Pa.; L. N. Hunter, Johnstown, Pa.; Prof. C. O. Mackey, Ithaca; R. D. Madison, Buffalo and Prof. L. G. Miller, East Lansing, Mich.

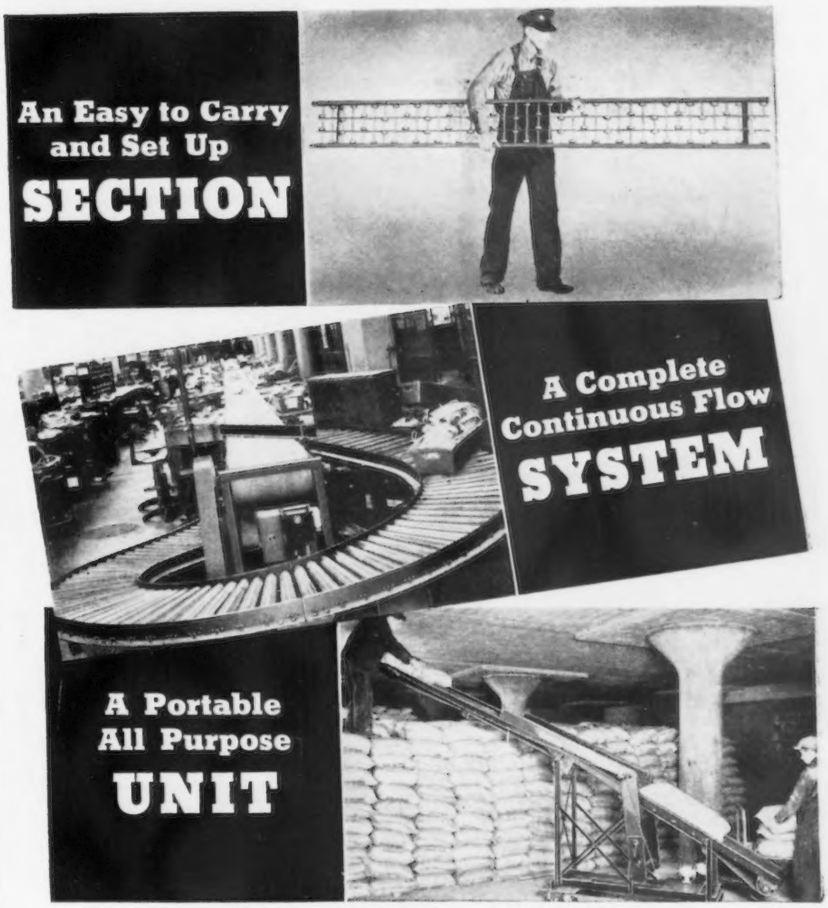
ALCOA Reports 39 Pct Drop in Production; Sales Outlook Bright

Pittsburgh

• • • **Reduced demands** for aluminum occasioned by the ending of the war decreased production of new aluminum by Aluminum Co. of America in 1945, 39 pct as compared with production in 1944, according to the company's annual report. Consolidated net income for 1945, after deducting all expenses incident to operation, taxes, depreciation and amortization, and including the refundable portion of prior years' taxes arising from unused excess profits tax credit, decreased to $19,951,462. Reported income for 1944 was $31,693,480, but this was subject to a downward adjustment on account of the increased amounts allowable for amortization of war facilities and other items. Net income for 1944 so adjusted is $27,009,681, the report stated. Thus the net income for 1945 represents a drop of 26 pct from the adjusted net income for 1944.

Alcoa's special problems in reconversion were confined primarily to expansion of markets and finding new uses for aluminum so as to utilize the greatly increased facilities upon which, immediately prior to and during the war, the company expended approximately $300,000,000 of its own money and built and operated more than $450,000,000-worth of facilities for the government.

The future outlook for aluminum markets is promising. The potential market for Alcoa roofing sheet, a new product, runs into hundreds of millions of pounds. More general use of aluminum in the railroad and automotive fields is predicted. Cargo and passenger ships are being built with aluminum superstructures and upper decks. Large scale production has been started on lines of aluminum canoes and other small pleasure craft. Prospects are good for widespread new uses of aluminum in architecture—from windows to garage doors to screens. Increasingly large amounts of the metal will also be used for industrial chemical equipment, irrigation pipes, license plates, diesel engines—in fact for applications ranging from locomotives to clothespins.



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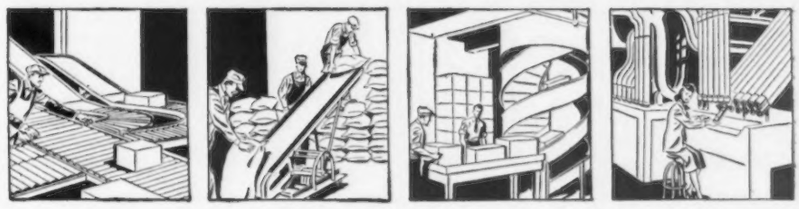

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